Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code :** | **17LN2001** | **Duration :** | **3hrs** |
| **Course Name :** | **FRENCH** | **Max. Marks :** | **100** |

**PART – A(4 X 20= 80 MARKS)**

**(Answer all the Questions)**

|  |  |  |  |  |  |
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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome / Bloom’s**  **Level** | **Marks** | |
| 1. | a. | La fête nationale est \_\_\_\_\_\_\_ (2 mars / 14 Juillet / 4Juin) | CO1 / R | 1 | |
|  | b. | Comment vas -tu? | CO1 / R | 1 | |
|  | c. | 1.Il fait chaud \_\_\_\_\_\_\_\_\_\_\_\_  a) en été b) en hiver c) au printemps  2.Il fait froid\_\_\_\_\_\_\_\_\_\_\_ a) au printemps b) en hiver c)en automne | CO1 / R | 2 | |
|  | d. | Ecrivez en anglaise  Bonjour, Au revoir | CO1 / R | 2 | |
|  | e. | **Conjuguez les verbes.**  1. Mon père \_\_\_\_\_\_\_\_\_\_\_\_\_\_(réussir)  2. Tu \_\_\_\_\_\_\_\_\_\_\_\_\_\_(placer)  3. Nous \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(voyager)en France  4. Elles \_\_\_\_\_\_\_\_\_\_\_(être)belles  5. Nous \_\_\_\_\_\_\_\_\_\_\_\_\_(commencer)  6.Nous \_\_\_\_\_\_\_( manger) des fruits.  7. Mes parents \_\_\_\_\_\_\_\_\_\_( arriver) à la gare à 6 heures.  8. Les artistes \_\_\_\_\_\_\_\_\_\_ (choisir) une pièce intéressant.  9. Je \_\_\_\_\_\_\_\_\_\_\_(acheter) un roman  10. Nous \_\_\_\_\_\_\_\_\_\_\_\_(être) Indiens  11. Je \_\_\_\_\_\_\_\_\_\_\_\_\_(écouter) de la musique.  12. Nous \_\_\_\_\_\_\_( manger) des fruits.  13. Mes parents \_\_\_\_\_\_\_\_\_\_( arriver) à la gare à 6 heures.  14. Les artistes \_\_\_\_\_\_\_\_\_\_ (choisir) une pièce intéressant. | CO1 / U | 14 | |
|  | | | | | |
| 2. | a. | La France s’appelle \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  a. L’hexagone b. L’octagone c. le pentagone | CO1 / R | 1 | |
|  | b. | 1. La capitale de la France est \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | CO1 / R | 1 | |
|  | c. | Comment vas -tu ? | CO1 / R | 2 | |
|  | d. | Quelle est ta nationalité? | CO1 / R | 2 | |
|  | e. | **Complétez avec l’adjectifs possessifs: (Mon, ton, leurs, son, votre)**  1.\_\_\_\_\_\_\_\_chien ne mange pas les biscuits  2. Je suis alle a Pairs Pendant \_\_\_\_\_\_\_\_vacances  3.\_\_\_\_\_\_\_\_\_ami s’appelle Lydia  4. J’aime \_\_\_\_\_\_\_\_\_chambre. Et \_\_\_\_\_\_\_\_meubles.  5. Vous avez \_\_\_\_\_\_\_\_carte d’identité.  6. Elle prend \_\_\_\_\_\_\_petit déjeuner.  7.Ou est \_\_\_\_\_\_\_\_\_fiance ?  8. C’est \_\_\_\_\_\_\_\_\_voiture ?  Conjuguez les verbes  1.venir2.prendre 3. faire | CO1/ U | 14 | |
|  |  |  |  |  | |
| 3. | a. | C ‘ est \_\_\_\_\_\_\_\_\_\_stylo (un /une /des | CO2 / R | 1 | |
|  | b. | Je \_\_\_\_\_\_\_\_\_\_(aller) a l’école | CO3/ R | 1 | |
|  | c. | Ecrivez en anglaise  Stylo, Bonsoir, Bonne nuit | CO2 / R | 2 | |
|  | d. | Comment Tu t’appelles? | CO2 / R | 2 | |
|  | e. | Ecrivez les nombres (1 – 15) | CO2 / U | 14 | |
| **(OR)** | | | | | |
| 4. | a. | Ecrivez en français  Birds cake | CO2 / R | 1 | |
|  | b. | Ecrivez en anglais  Voiture, livre | CO2 / R | 1 | |
|  | c. | Ecrivez deux animaux | CO2 / R | 2 | |
|  | d. | Ecrivez deux corps | CO2 / R | 2 | |
|  | e. | i)Ecrivez les jours de la semaine  ii) Ecrivez les saisons | CO2 / U | 14 | |
|  |  |  |  |  | |
| 5. | a. | Au printemps\_\_\_\_\_\_\_\_\_\_\_\_  a) il fait beau b) il pleut c) il fait du vent | CO3 / R | 1 | |
|  | b. | Je \_\_\_\_\_\_\_\_\_\_(faire) le devoir | CO3 / R | 1 | |
|  | c. | Ecrivez en anglaise  La couleur , rouge, une maison | CO3 / R | 2 | |
|  | d. | Écrivez de deux mois de l ‘ année | CO3 / R | 2 | |
|  | e. | **Reliez les colones**  1.Lundi - Saturday  2.Dimanche - august  3. Vendredi - Monday  4. Une femme - Sunday  5. Un manteau - Friday  6. Août - A Lady  7. Mai - pepper  8. Du poivre - May  9. L’avion - Ticket  10. Billet - Aeroplane  **Mets les phrases a la forme négative**  1.Je bavarde beaucoup  2. Nous écoutons la radio  3. Marie habite a Paris  4. Ils montent la tour Eiffel | CO3 / U | 14 | |
| **(OR)** | | | | | |
| 6. | a. | Ou habites -tu ? | CO3 / R | 1 | |
|  | b. | A Quelle heure vas -tu au collège ? | CO3 / R | 1 | |
|  | c. | Nommez deux vêtements | CO3 / R | 2 | |
|  | d. | Deux monument en français | CO1/ R | 2 | |
|  | e. | Cochez la bonne réponse:  1.J’habite \_\_\_\_\_\_\_ (à / au) Paris.  2. Il\_\_\_\_\_ (est / a) 45 ans.  3.Ils \_\_\_\_\_ (ont / sont) intelligents.  4.Feminin d’ Indien \_\_\_\_\_\_\_ (indienne / italien )  5.Masculin de chinoise \_\_\_\_\_\_\_ ( china / chinois)  6.Feminin de Suisse \_\_\_\_\_\_\_\_ (Suisse / russe)  **7.**J’\_\_\_\_\_\_\_ ( ai / suis ) deux enfants.  8.Vous \_\_\_\_\_\_\_ (êtes / avez ) Japonais?  9.Tu parles \_\_\_\_\_\_\_ ( anglais / inde )  10.L’aeroport \_\_\_\_\_\_ (est / as) en face de banque.  Conjuguez les verbes  11.Il \_\_\_\_\_\_\_(aimer) visiter le temple.  12.Nous \_\_\_\_\_\_(détester) la mer.  13.Vous \_\_\_\_\_\_\_(avoir) des livres.  14.Je \_\_\_\_\_\_(habiter) au Portugal. | CO3 / U | 14 | |
|  |  |  |  |  | |
| 7. | a. | Est ce que tu es végétarien? | CO4 / R | 1 | |
|  | b. | Je \_\_\_\_\_\_\_\_\_(se lever) à 6hr | CO5/ R | 1 | |
|  | c. | Ecrivez en anglais  La Mère , le père, l’ oncle, la sœur | CO4 / R | 2 | |
|  | d. | Nommez deux légumes | CO4 / R | 2 | |
|  | e. | Marc parle français très bien, parce qu’il est français. En France, tout le monde° parle français, même les enfants°! Beaucoup de Français parlent anglais aussi. Marc apprend° l’anglais à l’école. Comme Marc et Julie sont de bons amis, ils étudient ensemble°. Marc aide Julie à apprendre le français. Julie aide Marc à apprendre l’anglais. Julie étudie le français à l’école aussi. Julie parle français avec° un accent américain, et Marc parle anglais avec un accent français. Julie et Marc sont de bons amis, mais comme tout le monde, ils ont des opinions différentes. Ils ont beaucoup de discussions. Julie a un chien°. Il s’appelle Chouchou. Chouchou est un bon chien. Comme tous les chiens, il écoute les conversations. Il comprend° le français.  true or false. Correct the false statements.  1. Marc parle français très bien parce qu’il étudie le français à l’école.  2. En France, tout le monde parle anglais.  3. Julie apprend le français à l’école.  4. Julie aide Marc à apprendre l’anglais.  5. Le chien de Marc s’appelle Chouchou.  6. Chouchou écoute et comprend le français.  Indicate whether each statement is true or false. Correct the false statements.  1. L’immeuble des Dupont a quarante étages.  2. L’appartement des Dupont a l’air conditionné.  3. La chambre du frère de Marc est à côté du salon.  4. Marc a une sœur.  5. Dans le salon des Dupont, il n’y a pas de piano.  6. Il y a des portraits dans la chambre de Marc.  7. Dans le salon, il y a un lit.  8. Dans la chambre de Marc il y a quatre chaises et deux lampes.  9. Il y a quatre personnes dans la famille de Marc.  10. Monsieur Dupont est chef de cuisine. | CO4 / U | 14 | |
| **(OR)** | | | | | |
| 8. | a. | Je \_\_\_\_\_(venir) de Paris | CO4 / R | 1 | |
|  | b. | Quel âge as-tu ? | CO4 / R | 1 | |
|  | c. | Ecrivez en anglais  Le Chat ,le fromage | CO4 / R | 2 | |
|  | d. | Est-ce que vous aimez les sports ? | CO4 / R | 2 | |
|  | e. | Dans le taxi  Navin: Vous êtes Paris?  Karim: Non, de Toulouse, mais je suis algérian.  Sylvie: Et moi, Je suis mauricienne.  Navin: Qu’est-ce que vous faites?  Karim: Je suis informaticien.  Sylvie: Vous parlez très bien le français! Vous parlez d’autres langues?  Navin: Je parle hindi chez moi.Avec les tourists, je parle  anglais, français . Et aussi allemande,mais un peu.  Sylvie: C’est formidable!  Navin: Est-ce que vous êtes marié?  Karim: Non, je suis célibataire.  Sylvie: L’hôtel est loin?  Navin: Euh. On y est.  A. Cochez la bonne réponse:  1.Le touriste habite à Paris / Toulouse.  2. Le guide parle bien / ne parle pas bien le français.  3. La femme est français / mauricienne.  4. Karim est marié / Célibataire / divorcée.  5. Le touriste est étudiant / informaticien.  Vrai ou Faux?  1.Navin parle hindi.  2. Karim est informaticien.  3. Navin est Divorcée.  4.Sylvie est Algerian.  5. L’hôtel est loin. | CO4 / U | 14 | |
|  | | **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** |  |  | |
| 9. | a. | Vont /au /cinéma/ils/ne/pas | CO1 / R | 1 | |
|  | b. | Nommez deux couleurs | CO3/ R | 1 | |
|  | c. | Les articles indefini  1.Voila \_\_\_\_\_\_\_\_\_\_frere de Paulin  2. Tu prefers \_\_\_\_\_\_\_\_\_\_\_glace.  3. \_\_\_\_\_\_\_\_\_\_\_\_horologe est noire. | CO1 / R | 3 | |
|  | d. | Présentez-vous | CO5 / R | 5 | |
|  | e. | Marc est français. Il est gentil et intelligent. Il est un ami de Julie. Julie est américaine. Elle est très intelligente et sympa aussi°. Ils sont amis.  À l’école de Marc, il y a° beaucoup de filles et de garçons français. Ils sont élèves°. L’école de Marc est très grande.  À l’école de Julie, il y a des filles et des garçons aussi. Il y a des élèves américains. L’école de Julie est petite. Le père° de Marc s’appelle° Raoul Dupont. Les parents de Julie s’appellent Franklin.  Indicate whether each statement is true or false. Correct the false statements.  1. Marc Dupont est français.  2. Marc et Julie sont amis.  3. À l’école de Marc, il y a des garçons et des filles américains.  4. L’école de Julie est très grande.  5. Le père de Marc s’appelle Marc aussi.  6. Julie est française.  1. Marc n’est pas américain. Il est ...........  2. L’école de Marc n’est pas petite. Elle est ............  3. Julie n’est pas un garçon. Elle est une . . .............  4. Les parents de Julie ne s’appellent pas Dupont. Ils s’appellent ........... | CO6 / U | 10 | |
|  |  |  |  |  | |
|  | | **COURSE OUTCOMES** | | | |
| CO1 | | Use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type | | | |
| CO2 | | Understand the French culture and its nuances | | | |
| CO3 | | Interact in a simple way provided the other person talks slowly and clearly and is prepared to help. | | | |
| CO4 | | Learn the basic expressions of French and handle them confidently. | | | |
| CO5 | | Learn the various strategies to overcome the basic difficulties in LSRW | | | |
| CO6 | | Become familiar with the strategies of handling language contexts. | | | |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | Remember | Understand | Apply | Analyze | Evaluate | Create | Total |
| CO1 | 10 | 14 | - | - | - | - | 24 |
| CO2 | 6 | 14 | - | - |  |  | 20 |
| CO3 | 6 | 14 | - | - | - | - | 20 |
| CO4 | 6 | 14 | - | - |  |  | 20 |
| CO5 | 2 | - | - | - | - | - | 2 |
| CO6 | - | 14 | - | - | - | - | 14 |
|  | | | | | | | 100 |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **14EN2010 / 17LN2002** | **Duration :** | **3hrs** |
| **Course Name** | **FRENCH - II** | **Max. Marks :** | **100** |

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| **Q. No.** | | **Sub Div.** | | **Questions** | | | | | **Course Outcome / Bloom’s level** | | | **Marks** |
|  | |  | | **PART – A(4 X 20= 80 MARKS)**  **ANSWER ALL QUESTIONS** | | | | |  | | |  |
| 1. | | a. | | M.Kumar partira pour ............ ( Lyon / Marseil | | | | | CO 1 / R | | | 1 |
|  | | b. | | Quel animal aimes – tu ? | | | | | CO 1 / R | | | 1 |
|  | | c. | | Écrivez de deux jours de la semaine | | | | | CO 1 / R | | | 2 |
|  | | d. | | OùestLyon ? | | | | | CO 1 / R | | | 2 |
|  | | e. | | Écrivez les verbes au passé récent :   1. Je ( finir ) Mon devoir 2. Nous ( arriver ) à l ‘ école 3. Ils( faire ) le marché. 4. Je ( payer ) en liquid. 5. Je ( voir ) un serpent. 6. Elle ( vendre ) samaison 7. Je ( donner ) un pourboire au garçon | | | | | CO 1 / U | | | 14 |
| **(OR)** | | | | | | | | | | | | |
| 2. | | a. | | Trouvez le verbe : “viens “ | | | | | CO 1 / R | | | 1 |
|  | | b. | | Conjugez le verbe au Impératif : “ écouter “ ( forme nous ) | | | | | CO 1 / R | | | 1 |
|  | | c. | | OùestDakar ? | | | | | CO 1 / R | | | 2 |
|  | | d. | | Est-ce que la langue française est official à Dakar ? | | | | | CO 1 / R | | | 2 |
|  | | e. | | Ècrivez les verbes entre parenthèses au futur proche :   1. Il ( avoir ) mal à faire ce travail 2. Sans doute , elle ( chanter ) bien. 3. Je ( finir ) Mon devoir dans une heure. 4. Il ( attendre ) son amie 5. Elle ( dire ) la vérité 6. Ils( dormir ) avant 10 heures 7. Elles( aller ) à Londres | | | | | CO 1 / U | | | 14 |
|  | |  | |  | | | | |  | | |  |
| 3. | | a. | | Julie ........ la main quand elle trouve la mouche ( lave / lève ) | | | | | CO 2 / R | | | 1 |
|  | | b. | | Donnez le participe passé le verbe “ venir“ | | | | | CO 2 / R | | | 1 |
|  | | c. | | Est-ce que la madame Kumar va lire roman ? | | | | | CO 2 / R | | | 2 |
|  | | d. | | La fille de Kumar , elle s’ appelle comment ? | | | | | CO 2 / R | | | 2 |
|  | | e. | | Traduisez en anglais : La France est très connue pour la cuisine, le vin, et le fromage. Il y a plus de300 sortes de fromages en France. Habituellement, les Français prennent trois repas parjour. Quelque fois les enfants prennent le goûter aussi. Le petit déjeuner (7 h – 8 h). Simple bol de café noir,café au lait ou chocolat,tartines de beurre ou des céréales. Le déjeuner (11 h – 15 h). Souvent pris sur les lieux de leur travail-restaurant, cantine ou «panier-repas». Il se limite d’un seul plat suivi d’un petit dessert. Le goûter ou le thé (16 h – 18 h). Pour les enfants : pain, chocolat, lait.Pour les grandes personnes : thé,toast,petitsfours. Le dîner (19 h – 21 h). Un repas familial. C ’est le repas principal : hors-d’œuvre, plat principal,fromage et dessert. Dans un repas plus organisé , on peut commencer avec des entrées ou deshors-d’œuvre : salade , crevettes , crabes etc . suivi d’un ou de deux plats principaux: viandes, poissons, avec des accompagnements variés (légumes,lentillesetc). Puis des fromages, du dessert, des vins et du café. | | | | | CO 2 / U | | | 14 |
| **(OR)** | | | | | | | | | | | | |
| 4. | | a. | | Le dîner est un repas familial : Oui ou Non | | | | | CO 2 / R | | | 1 |
|  | | b. | | Le marché de Sandaga dans le ............ ( centre – ville / à la plage ) | | | | | CO 2 / R | | | 1 |
|  | | c. | | Écrivez en anglais : Une cuillère en bois | | | | | CO 2 / R | | | 2 |
|  | | d. | | Quel sport est très populaire au Sénégal ? | | | | | CO 2 / R | | | 2 |
|  | | e. | | Conjuguez les verbes au présent : 1. Faire , 2 . Avoir | | | | | CO 2 / U | | | 14 |
|  | |  | |  | | | | |  | | |  |
| 5. | | a. | | Écrivez le mot “small “ en français | | | | | CO 3 / R | | | 1 |
|  | | b. | | Écrivez le mot “ chat “ en anglais | | | | | CO 3 / R | | | 1 |
|  | | c. | | Écrivez de deux mois de l ‘ année | | | | | CO 3 / R | | | 2 |
|  | | d. | | Où est le Sénégal situer ? | | | | | CO 3 / R | | | 2 |
|  | | e. | | Thomas Friedman habite aux États-Unis . Il parle du Thanksgiving. «Marnère est française, mais mon père est américain. Nous passons une année ici en Luisiane. On parle français ici, alors je parle les deux langues -anglais et français. C'est utile ça .  Le dernier Jeudi de novemhre, c'est le Thanksgiving. Ce n' est pas une fête religieuse, c’est une fête qui marque la première recolte des PilgrimFathers en 1621. Nous n 'alIons pas travailler ce iour-la. Nous allons rester à la maison et on va manger un grand repas avec de la dinde, des légumes et, comme dessert, de la tarle à la citrouile.» | | | | | CO 3 / U | | | 14 |
| **(OR)** | | | | | | | | | | | | |
| 6. | | a. | | Quelle est ta nationalité ? | | | | | CO 3 / R | | | 1 |
|  | | b. | | Le chat , il s ‘appelle ............. ( Blanche , Blanco ) | | | | | CO 3 / R | | | 1 |
|  | | c. | | À quelle heure On mange le petit déjeuner ? | | | | | CO 3 / R | | | 2 |
|  | | d. | | Quels sont les repas français ? | | | | | CO 3 / R | | | 2 |
|  | | e. | | Complete la conversation avec la forme correcte du verbe “faire”.  Thomas: De la voile! Chic! Ma sœur aime ça. Mais aujourd'hui,  (1) elle ...... ses devoirs.  Hassan: II n'y a pas assez de place pour trois dans le bâteau.  Thomas: Alors,  (2) on \_\_\_\_ de la voile, nous deux?  Hassan: D'accord, et  (3) nous \_\_\_ les courses plus tard, non?  Marine, la sceur de Thomas arrive.  Marine: Salut, Hassan. Salut, Thomas. Qu'est-ce que  (4) vous......... ?  Thomas: Nous alIons au lac. (5) Nous \_\_\_\_ de la voile.  Marine: Bon, j 'arrive. J'aime ça.  Thomas: Mais, (6) tu\_\_\_\_\_\_\_\_ tes devoirs, n'est-ce pas?  Marine: ,Et vous, (7) vous \_\_\_\_\_\_\_\_ les courses, non? | | | | | CO 3 / U | | | 14 |
|  | |  | |  | | | | |  | | |  |
| 7. | | a. | | Tu t’appellescomment ? | | | | | CO 4 / R | | | 1 |
|  | | b. | | As – tu des frères ? | | | | | CO 4 / R | | | 1 |
|  | | c. | | Ton père , il s’ appelle comment ? | | | | | CO 4 / R | | | 2 |
|  | | d. | | Le frère de ta mère est ton o......... e | | | | | CO 4 / R | | | 2 |
|  | | e. | | Écrivez le négative : ( utilisez ne .......... pas )  1.Nous prenons les livres.  2.Elle entre dans la cathédrale.  3.Ils rentrent à Rome.  4.Je viens du stade.  5.Montent-elles sur la moto?  6.Louise tombe sur le trottoir.  7.Gilles et Jérôme rentrent .  8.Pourquoi vous téléphonez ?  9.Êtes-vous à la maison?  10.Prends-tu le métro?  11. Vous montez les valises  12. Je parle français.  13. Vous allez au cinéma  14. Il travaille à l ‘ école | | | | | CO 4 / U | | | 14 |
| **(OR)** | | | | | | | | | | | | |
| 8. | | a. | | Les parents de son père sont tes g............ | | | | | CO 4 / R | | | 1 |
|  | | b. | | Aimez – vous le cinéma ? | | | | | CO 4 / R | | | 1 |
|  | | c. | | Écrivez le nombre 10 to 20 | | | | | CO 4 / R | | | 2 |
|  | | d. | | Quel est ton numéro de téléphone ? | | | | | CO 4 / R | | | 2 |
|  | | e. | | Eh bien; Télé aime la télévision, mais Blanco préfère la radio ... voilà, c'est très bien... mais non! Ce n'est pas très bien parce qu'il y a aussi Jules et quelquefois, il y a Néron. Jules est le perroquet de ma Soeur, Claire. Il est petit et très mignon, mais il n' aime pas la télévision, il n’ aime pas la radio et il déteste la musique. Et Neron, qui est-il? Eh bien ... Nerori est un gros chien noir et blanc. C'est le chien demongrand-pere et il est tresmechant. Il deteste les chats, il deteste les perroquets, il deteste la radio, il deteste la musique et il n' aime pas beaucoup le chien de Marc. Alors, qu'est-ce qu'il aime, Neron? Il aime deux choses: mon grand-pere et le football ... a la television, naturellement! Il adore ça! | | | | | CO 4 / U | | | 14 |
|  | | | | **PART – B(1 X 20= 20 MARKS)**  **Compulsory**: | | | | |  | | |  |
| 9. | | a. | | Trouvez le mot : L -- -- n | | | | | CO 1 / R | | | 1 |
|  | | b. | | Dites vrai ou faux : M. Lavigne a téléphoné à son frère. | | | | | CO 1 / R | | | 1 |
|  | | c. | | Trouvez les verbes : 1. Parti , 2. Sorti , 3. Fini | | | | | CO 1 / R | | | 3 |
|  | | d. | | Trouvez le contraire :  1. loin de ............................... (près de/à côté de)  2. pas encore ............................... (encore/déjà)  3. là bas ............................... (voilà/ici)  4. demain ............................... (prochain/hier)  5. sans ............................... (avec/sur) | | | | | CO 5 / R | | | 5 |
|  | | e. | | Retrouvez les phrases :  1. Vacances/elles/bonnes/ont/passé/de.  2. Je/nouvelles/de/ai/pas/eu/n’.  3. Longtemps/restés/sont/à/Paris/ils.  4. Lu / journal / d’ / -t’ / a / le / hier / il ?  5. Elle/oublié/a/à/la/n’/d’/banque/pas/aller. | | | | | CO 6 / U | | | 10 |
|  | | **COURSE OUTCOMES** | | | | | | | | | | | |
| CO1 | | Use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type | | | | | | | | | | | |
| CO2 | | Understand the French culture and its nuances | | | | | | | | | | | |
| CO3 | | Interact in a simple way provided the other person talks slowly and clearly and is prepared to help. | | | | | | | | | | | |
| CO4 | | Learn the basic expressions of French and handle them confidently. | | | | | | | | | | | |
| CO5 | | Learn the various strategies to overcome the basic difficulties in LSRW | | | | | | | | | | | |
| CO6 | | Become familiar with the strategies of handling language contexts. | | | | | | | | | | | |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | | | | | | | |
| CO / P | | | | **Remember** | | **Understand** | **Apply** | **Analyze** | **Evaluate** | | **Create** | **Total** | |
| CO1 | | | | 10 | | 14 | - | - | - | | - | 24 | |
| CO2 | | | | 6 | | 14 | - | - |  | |  | 20 | |
| CO3 | | | | 6 | | 14 | - | - | - | | - | 20 | |
| CO4 | | | | 6 | | 14 | - | - |  | |  | 20 | |
| CO5 | | | | 2 | | - | - | - | - | | - | 2 | |
| CO6 | | | | - | | 14 | - | - | - | | - | 14 | |
|  | | | | | | | | | | | | **100** | |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **16CA2017 / 17CA2017** | **Duration** | **3hrs** |
| **Course Name** | **OBJECT ORIENTED ANALYSIS AND DESIGN** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Summarize the salient features of object oriented systems development. | CO1 | U | 10 |
|  | b. | Refer to the code snippet below and answer the following questions:  #include <iostream>  using namespace std;  Class Room {  public:  double length;  double breadth;  double height;  Room()  {  length = breadth = height = 0;  }  Double calculateArea() {  return length \* breadth;  }  double calculateVolume() {  return length \* breadth \* height;  }  };  int main() {  Room room1, room2(25, 20, 15);  room1.length = 42.5;  room1.breadth = 30.8;  room1.height = 19.2;  cout<< "Area of Room = "<< room1.calculateArea() <<endl;  cout<< "Volume of Room = "<< room1.calculateVolume() <<endl;  return 0;  }   1. Identify the names of the objects in the above code. 2. Identify the name of the class in the above code. 3. Identify the constructor in the above code. 4. Identify the errors (three errors) in the above code. 5. What would be the output of room2.calculateArea(); | CO1 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Design a class *dog*with 5 attributes and three instance methods. Create an object of the *dog*class and call the instance methods. | CO1 | A | 10 |
|  | b. | Design interfaces for the following class hierarchy:    Define at least two interfaces for each class and sketch the same using a neat diagram. | CO1 | E | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain the phases of object-oriented development life cycle. | CO2 | U | 10 |
|  | b. | Develop any ten use cases of an address book and explain them. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Sketch Level 0, 1, and 2 data flow diagrams for a library management system. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 5. |  | Sketch the use case diagram with at least five use cases for student result management system and explain the functionality of each case. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Illustrate common class patterns approach with appropriate examples. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate *a-part-of* relationship patterns with suitable examples. | CO4 | A | 10 |
|  | b. | Explain inheritance and its types with examples. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Sketch class diagrams that depict aggregation-containment relationships. | CO4 | A | 10 |
|  | b. | Distinguish between aggregation-containment and generalization-specialization with a suitable example. | CO4 | An | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Apply a three-tier approach design to a simple banking application with the following functions:   1. Creating a new account with minimum balance Rs. 5000/- 2. Depositing amount to the account. 3. Withdrawing money from the account maintaining minimum balance. 4. Calculating 4% interest every month for the minimum account balance in that month. | CO5 | A | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Show the importance of system analysis and design in software development. |
| CO2 | Understand Object Oriented Software Development Process. |
| CO3 | Gain exposure to Object Oriented Methodologies & UML Diagrams. |
| CO4 | Apply Object Oriented Analysis Processes for software projects. |
| CO5 | Construct various UML models. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 10 | 10 | 10 | 10 |  | 40 |
| CO2 |  | 10 | 30 |  |  |  | 40 |
| CO3 |  |  | 40 |  |  |  | 40 |
| CO4 |  | 10 | 20 | 10 |  |  | 40 |
| CO5 |  |  | 20 |  |  |  | 20 |
|  |  | 30 | 120 | 20 | 10 |  | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **16CA2020/17CA2020** | **Duration** | **3hrs** |
| **Course Name** | **.NET PROGRAMMING USING C#** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Summarize the history of object-oriented programming. | CO1 | U | 10 |
|  | b. | Explain the data types used in C# programming. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Construct a program to assign a value and print the same. | CO1 | A | 8 |
|  | b. | Summarize the features of .NET framework. | CO2 | U | 12 |
|  |  |  |  |  |  |
| 3. | a. | Summarize integer data types in C# programming. | CO1 | U | 10 |
|  | b. | Quote the operator precedence when a program statement involves multiple operators. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Construct a program that asks for the price of an item and how many are purchased, and then add the sales tax due based on your state’s sales tax rate. | CO3 | U | 15 |
|  | b. | Describe Reference data type. | CO3 | U | 5 |
|  |  |  |  |  |  |
| 5. | a. | Explain control statements with examples. | CO5 | U | 10 |
|  | b. | Describe about arrays in C# programming. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain looping statements and write a program to find the sum of series. | CO4 | A | 15 |
|  | b. | List any five string functions. | CO4 | U | 5 |
|  |  |  |  |  |  |
| 7. |  | Explain the types of inheritance using example. | CO6 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Compare constructor and destructor. | CO5 | U | 5 |
|  | b. | Describe method overriding with examples. | CO6 | U | 15 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Construct a table named ‘Student’ and with the attributes ‘Name’, ‘Regno’, ‘Department’, ‘Age’. Write a program to insert, delete and display the records. | CO5 | A | 10 |
|  | b. | Summarize database management system. | CO5 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the basic programming concepts of .NET framework. |
| CO2 | Understand object-oriented programming concepts of C#. |
| CO3 | Develop standalone applications in C#. |
| CO4 | Evaluate user requirements for software functionality required to decide whether the language meet the requirement. |
| CO5 | Propose the use of .Net Technologies by implementing them in the C# programming language for a given problem. |
| CO6 | choose an object-oriented approach for solving problems. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 30 | 8 | - | - | - | 38 |
| CO2 | - | 12 | - | - | - | - | 12 |
| CO3 | 10 | 30 | - | - | - | - | 40 |
| CO4 | - | 5 | 15 | - | - | - | 20 |
| CO5 | - | 25 | 10 | - | - | - | 35 |
| CO6 | - | 15 | 20 | - | - | - | 35 |
|  | | | | | | | **180** |

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| **Course Code** | **16CA2026/17CA2026** | **Duration** | **3hrs** |
| **Course Name** | **PROFESSIONAL ETHICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Discuss the different types of ethics. | CO1 | U | 5 |
|  | b. | Define the 4 – way Test adopted in ethical framework. | CO1 | R | 5 |
|  | c. | Identify your role as an IT professional involved in a group supporting the education needs among the students. | CO2 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Identify the role of expert witness. | CO2 | R | 10 |
|  | b. | Discuss the ethics in professional life. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Classify the different types of conflicts of interest in a well-defined manner. | CO3 | An | 10 |
|  | b. | Design and develop a suitable trademark for an e-learning software for claiming IPR. | CO2 | C | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the phenomenological theory of ethics. | CO2 | U | 10 |
|  | b. | Classify the academic dishonesty with suitable examples. | CO3 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Develop a Code of Ethics for the students in an examination hall. | CO4 | C | 10 |
|  | b. | Define the academic freedom with suitable example. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Illustrate the impact of the religion in ethics. | CO4 | A | 10 |
|  | b. | Identify five penalties for avoiding plagiarism of the data. | CO3 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Compare and contrast: data fabrication and falsification of data. | CO3 | E | 10 |
|  | b. | Examine the duties and responsibilities of a Journal Editor. | CO4 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the duties of the peer reviewers in detail. | CO5 | U | 10 |
|  | b. | Discuss about the scientific Journals. | CO5 | U | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Define the seven principles that are followed in the enforcement of code of ethics. | CO6 | U | 10 |
|  | b. | List down any five penalties for the violation of the Code. | CO6 | R | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the ethical framework in professional life. |
| CO2 | Know the psychology and philosophy of ethics. |
| CO3 | Recognize the ethics in scientific and engineering societies. |
| CO4 | Diagnose the code of ethics and ethical standards. |
| CO5 | Understand the integrity in research. |
| CO6 | Realize the Enforcement of Code of Ethics. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 5 | 15 | - | - | - | - | 20 |
| CO2 | 20 | 10 | - | - | - | 10 | 40 |
| CO3 | 10 | - | - | 20 | 10 | - | 40 |
| CO4 | 10 | 10 | 10 | - | - | 10 | 40 |
| CO5 | - | 20 | - | - | - | - | 20 |
| CO6 | 10 | 10 | - | - | - | - | 20 |
|  | | | | | | | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **16LN2005** | **Duration** | **3hrs** |
| **Course Name** | **TAMIL-I** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
|  |  | **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** |  |  |  |
| 1. | m. | rpWfij kd;ddd; ---------------- | CO3 | U | 1 |
|  | M. | tPukhKdpth; vOjpa rpWfij ----------------- | CO3 | U | 1 |
|  | ,. | rpWfijapd; mbg;gil Nehf;fk; ahJ? | CO3 | R | 2 |
|  | <. | Ma;jk; ngah;f;fhuzk; jUf. | CO1 | R | 2 |
| c. | m. | rpWfijapd; ,yf;fzk; vOJf. | CO3 | R | 5 |
|  | M. | rpWfij Mrphpah;fs; gw;wp vOJf. 1. t.Nt.R.Iah; 2. fy;fp 3. GJikg;gpj;jd;. | CO3 | R | 9 |
|  |  | **(OR)** |  |  |  |
| 2. | m. | mir ------------ tifg;gLk;. | CO1 | U | 1 |
|  | M. | nky;ypd vOj;Jf;fs; MWk; -------------- gpwf;fpd;wd. | CO1 | R | 1 |
|  | ,. | vOj;Jf;fspd; ,lg;gpwg;G gw;wp vOJf. | CO1 | R | 2 |
|  | <. | Njk;ghtzp E}y; tpsf;fk; jUf. | CO4 | R | 2 |
| c | m. | Fws; ntz;ghit vLj;Jf;fhl;Lld; tpsf;Ff. | CO1 | R | 5 |
|  | M. | Ntypad; $Wk; ey;thh;j;ijfs; Fwpj;J fl;Liu vOJf. | CO4 | R | 9 |
|  |  | (OR) |  |  |  |
| 3. | m. | filr;rq;f fhyj;jpd; ,Wjpapy; Njhd;wpa fhg;gpak; ----------- | CO1 | R | 1 |
|  | M. | jkpo; ,yf;fpaq;fs; ----------------- ,yf;fpaq;fs; vd miof;fg;gLfpwJ | CO5 | R | 1 |
|  | ,. | ntz;gh vj;jid tifg;gLk;? mit ahit? | CO1 | R | 2 |
|  | <. | rq;fk; kUtpa fhyk; Fwpg;G jUf. | CO5 | R | 2 |
| c | m. | ntz;ghtpd; nghJ ,yf;fzk; tpsf;fk; jUf. | CO1 | R | 5 |
|  | M. | jpiz Ik;ghy; kw;Wk; mtw;wpd; tpsf;fk; jUf | CO1 | R | 9 |
|  |  | (OR) |  |  |  |
| 4. | m. | jk; fy;yiwapy; jk;ik xU jkpo; khztd; vd;W vOjr; nra;jth; ------------------- | CO2 | U | 1 |
|  | M. | fpwpj;jt fk;gh; vd;W miof;fg;gl;lth; ------------------ | CO2 | U | 1 |
|  | ,. | rPfd; ghy;F Iah; Fwpg;G jUf. | CO2 | R | 2 |
|  | <. | vl;Lj;njhif E}y;fs; ahit? | CO5 | R | 2 |
| c. | m. | rq;ffhyr; rpwg;G gw;wp Fwpg;G jUf. | CO5 | R | 5 |
|  | M. | jkpo; ,yf;fpa tuyhw;wpd; Ml;rpf; fhyq;fs; gw;wp vOJf. 1. gy;yth; fhyk; 2. Nrhoh; fhyk; 3. INuhg;gpah; fhyk; | CO5 | R | 9 |
|  |  | **(OR)** |  |  |  |
| 5. | m. | jkpo; fpwpj;jth;fSf;F topghl;by; gad;gLkhW ghliy vOjpath; ------------------- | CO2 | U | 1 |
|  | M. | vl;Lj;njhifapy; mfg;nghUSK; Gwg;nghUSk; Nrh;e;j E}y; -------- | CO5 | U | 1 |
|  | ,. | jj;Jtg;Nghjfh; Fwpg;G jUf. | CO2 | R | 2 |
|  | <. | FWe;njhif Fwpg;G jUf. | CO5 | R | 2 |
| c. | m. | vr;.V.fpUl;bzg;gps;is Fwpg;G jUf. | CO2 | R | 5 |
|  | M. | jkpo;ehl;L fpwpj;jth;fs; gw;wp vOJf. 1. Ntjehafk; rh];jphpahh; 2. Ntjehafk; gps;is. | CO2 | R | 9 |
|  |  | (OR) |  |  |  |
| 6. | m. | $j;juhw;Wg;gil vd;Dk; E}ypd; kw;nwhU ngah;-------------- | CO5 | R | 1 |
|  | M. | neLe;njhif vd miof;fg;gLk; E}y; ---------------- | CO5 | R | 1 |
|  | ,. | neLey;thil Fwpg;G jUf. | CO5 | R | 2 |
|  | <. | ,aw;wkpo; - Fwpg;G jUf. | CO3 | R | 2 |
| c. | m. | mfehD}W Fwpg;G jUf. | CO5 | R | 5 |
|  | M. | vl;Lj;njhif E}y;fSs; Gwk; rhh;e;j E}y;fis vOJf. 1. gjpw;Wg;gj;J 2. GwehD}W | CO5 | R | 9 |
|  |  | (OR) |  |  |  |
| 7. | m. | Gul;rpf;ftpQh; vd;W miof;fg;gl;lth; ------------------ | CO3 | U | 1 |
|  | M. | ctikf;ftpQh; vd;W miof;fg;gl;lth; ----------------- | CO3 | U | 1 |
|  | ,. | gj;Jg;ghl;L E}y;fs; ahit? | CO5 | R | 2 |
|  | <. | FwpQ;rpg;ghl;L Fwpg;G jUf. | CO5 | R | 2 |
| c. | m. | ew;wpiz Fwpg;G jUf. | CO5 | R | 5 |
|  | M. | gj;Jg;ghl;L Mw;Wg;gil E}y;fs; gw;wp vOJf. 1. jpUKUfhw;Wg;gil 2. nghUeuhw;Wg;gil | CO5 | R | 9 |
|  |  | (OR) |  |  |  |
| 8. | m. | nrd;id muruit ftpQuhf tpsq;fpath; ---------------- | CO3 | U | 1 |
|  | M. | Njrpaf;ftp vd miof;fg;gl;lth; -------------------- | CO3 | U | 1 |
|  | ,. | ftpij xU ,yf;fpak; Fwpg;G jUf. | CO3 | R | 2 |
|  | <. | ftpkzp Njrpf tpehafk; gps;is Fwpg;G jUf. | CO3 | R | 2 |
| c. | m. | ehkf;fy; ftpQh; Fwpg;G jUf. | CO3 | R | 5 |
|  | M. | 20-Mk; E}w;whz;bd; ,izaw;w Gyth;fs; gw;wp vOJf. 1. ghujpahh; 2. ghujpjhrd; | CO3 | R | 9 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | m. | jkpo; tuyhw;Wg; Gjpdq;fspd; je;ij ----------------- | CO3 | U | 1 |
|  | M. | Kjy; tuyhw;Wg; Gjpdk; ------------- | CO3 | U | 1 |
|  | ,. | Nghyp vOj;Jf;fs; vd;why; vd;d? vj;jid tifg;gLk;? | CO1 | R | 2 |
|  | <. | gFgj cWg;Gfs; ahit? | CO1 | R | 2 |
| c. | m. | ty;ypdk; kpFk; ,lq;fis vLj;Jf;fhl;Lld; tpsf;Ff. | CO1 | R | 5 |
|  | M. | ehtypd; tiffis vOJf. | CO3 | R | 9 |

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|  | **COURSE OUTCOMES** |
| CO1 | **khzth;fs; r%f khw;wr; rpe;jidfis mwpe;Jnfhs;th;.** |
| CO2 | **khzth;fs; Gjpdj;ijf; fw;gjd; %yk; rKjhar; rpf;fy;fis czh;e;J mtw;wpw;Fj; jPh;Tfhz;gh;.** |
| CO3 | **ehlfq;fis r%fg; gad;ghl;bw;F Vw;g cUthf;Fk; jpwd; ngWth;.** |
| CO4 | **jkpo;f; fhg;gpaq;fspy; moFk; mwpTzh;Tk; Cl;Lk; gFjpfisg; gbj;Jg; Ghpe;J nfhs;th;.** |
| CO5 | **gz;ila ,yf;fpa gjpTfspy; cs;s goe;jkpohpd; MSikfisAk; milahsq;fisAk; mwpe;J nfhs;th;.** |
| CO6 | **Gjpdk; topj; jw;fhy rpf;fy;fisAk; mjw;fhd jPh;TfisAk; cUthf;Fk; jpwd; ngWth;.** |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 36 | 01 | - | - | - | - | 37 |
| CO2 | 18 | 03 | - | - | - | - | 21 |
| CO3 | 45 | 08 | - | - | - | - | 53 |
| CO4 | 11 | 00 | - | - | - | - | 11 |
| CO5 | 57 | 01 | - | - | - | - | 58 |
| CO6 | 00 | 00 | - | - | - | - | 00 |
|  | **167** | **13** |  |  |  |  | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **16LN2006** | **Duration** | **3hrs** |
| **Course Name** | **TAMIL-II** | **Max. Marks** | **100** |

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|  |  | **ANSWER ALL QUESTIONS**  **PART – A(4 X 20= 80 MARKS)** |  |  |  |
| 1. | m. | Mz;lhd; jkpio --------------- vd;W Fwpg;gpLfpwhh;. | CO1 | R | 1 |
|  | M. | njhy;fhg;gpak; --------- gphpTfisf; nfhz;lJ. | CO1 | R | 1 |
|  | ,. | rq;fk; ngah; tpsf;fk; jUf. | CO1 | R | 2 |
|  | <. | ghapuj;jpd; nghJg;ngah;fs; ahit? | CO1 | R | 2 |
| c. | m. | fhtyh;fs; ghtyh;fs; Fwpg;G jUf. | CO1 | R | 5 |
|  | M. | Kr;rq;f tuyhW Fwpj;j nra;jpfis njhFj;J vOJf. | CO1 | R | 9 |
|  |  | **(OR)** |  |  |  |
| 2. | m. | #j;jpuk; ------------- tifg;gLk;. | CO1 | U | 1 |
|  | M. | E}y; --------------- tifg;gLk;. | CO1 | U | 1 |
|  | ,. | #j;jpuk; tpsf;Ff. | CO1 | R | 2 |
|  | <. | fPo;f;fzf;F E}y;fs; tpsf;fk; jUf. | CO2 | R | 2 |
| c. | m. | E}y; ngah;f;ffhuzk; jUf. | CO1 | R | 5 |
|  | M. | khzhf;fhpd; tifiaAk; khzhf;fh; Mfhjthpd; jd;ikiaAk; tpsf;Ff. | CO1 | R | 9 |
|  |  | (OR) |  |  |  |
| 3. | m. | jphp vd;gjd; nghUs; ------------------ | CO2 | U | 1 |
|  | M. | Mrhuk; vd;gjd; nghUs; ---------------------- | CO2 | U | 1 |
|  | ,. | jpizkhiy E}w;iwk;gJ Fwpg;G jUf. | CO2 | R | 2 |
|  | <. | Nguhrphpah;. Re;juk;gps;is Fwpg;G jUf. | CO5 | R | 2 |
| c. | m. | ehybahh; Fwpg;G jUf. | CO2 | R | 5 |
|  | M. | ey;y Mrphpah; ,yf;fzKk;> mtw;wpd; jd;ikiaAk; tpsf;Ff. | CO1 | R | 9 |
|  |  | (OR) |  |  |  |
| 4. | m. | Ie;jpiz mWgJ vd;w rpwg;gpidg; ngw;w E}y; ----------------- | CO2 | R | 1 |
|  | M. | gQ;rk; vd;gjd; nghUs; ---------------- | CO2 | U | 1 |
|  | ,. | 19-Mk; E}w;whz;bd; ehlf tiffs; ahit? | CO5 | R | 2 |
|  | <. | ciueil Fwpg;G jUf. | CO2 | R | 2 |
| c. | m. | Mrhuf;Nfhit Fwpg;G jUf. | CO2 | R | 5 |
|  | M. | ePjp E}y;fspy; mwk; gw;wpa E}y;fis vOJf. 1. .jphpfLfk; 2. Vyhjp 3. rpWgQ;r%yk;. | CO2 | R | 9 |
|  |  | **(OR)** |  |  |  |
| 5. | m. | jkpo;nkhopapy; Njhd;wpa Kjy; ehlf E}y; ------------- | CO5 | R | 1 |
|  | M. | ehlftpay; vd;w E}iy vOjpath; --------------- | CO5 | R | 1 |
|  | ,. | fy;ntl;Lf;fs; Fwpg;G jUf. | CO5 | R | 2 |
|  | <. | goe;jkpo; ciueil E}y;fs; ahit? | CO2 | R | 2 |
| c. | m. | gonkhop Fwpg;G jUf. | CO2 | R | 5 |
|  | M. | jpUf;Fwspd; ngahf;fhuzKk; mjd; rpwg;gpay;GfSk; tpsf;Ff. | CO2 | R | 9 |
|  |  | (OR) |  |  |  |
| 6. | m. | njd;dhl;L ngh;dhl;rh vd;W miof;fg;gl;lth; ------------ | CO5 | U | 1 |
|  | M. | ebg;Gf;fiy Mrhd; vd;W miof;fg;gl;lth; ----------------- | CO5 | U | 1 |
|  | ,. | jd;ikazp tpsf;fk; jUf. | CO1 | R | 2 |
|  | <. | fhtb Ml;lk; Fwpg;G jUf. | CO3 | R | 2 |
| c. | m. | jw;Fwpg;Ngw;w mzpia vLj;Jf;fhl;Lld; tpsf;Ff. | CO1 | R | 5 |
|  | M. | ehlfj;Jiw mwpQh;fs; gw;wp tpsf;fk; jUf. 1. rq;fujh]; Rthkpfs; 2. gk;ky; rk;ke;j Kjypahh;. | CO5 | R | 9 |
|  |  | (OR) |  |  |  |
| 7. | m. | jPgfk; vd;gjd; nghUs; ------------------- | CO1 | U | 1 |
|  | M. | VJ vd;gjd; nghUs; ---------------------- | CO1 | U | 1 |
|  | ,. | Ntw;Wikazpia tpsf;Ff. | CO1 | R | 2 |
|  | <. | ngha;f;fhy; Fjpiu Ml;lk; tpsf;Ff. | CO3 | R | 2 |
| c. | m. | ry;ypf;fl;L Fwpg;G jUf. | CO3 | R | 5 |
|  | M. | $j;J gw;wp fl;Liu tiuf. 1. njUf;$j;J 2. fiof;$j;J 3. ghitf;$j;J. | CO3 | R | 9 |
|  |  | (OR) |  |  |  |
| 8. | m. | fufk; vd;gjd; nghUs; ------------------ | CO3 | U | 1 |
|  | M. | rf;if vd;gjd; nghUs; ----------------- | CO3 | U | 1 |
|  | ,. | fpl;bg;Gs; Fwpg;G jUf. | CO3 | R | 2 |
|  | <. | cr;rhpg;G tpisahl;L Fwpg;G jUf. | CO3 | R | 2 |
| c. | m. | ehl;Lg;Gwf; fiyapd; tsh;r;rp epiyfs; gw;wp tpsf;Ff. | CO3 | R | 5 |
|  | M. | ehl;Lg;Gw ehlfq;fs; gw;wp fl;Liu vOJf.1.gs;S ehlfk; 2. FwtQ;rp ehlfk; 3. nehz;b ehlfk;. | CO3 | R | 9 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | m. | jkpo;j;jhj;jh vd;W miof;fg;gl;lth; ----------------- | CO5 | U | 1 |
|  | M. | jkpoj;njd;wy; vd;W miof;fg;gl;lth; ------------------ | CO5 | U | 1 |
|  | ,. | MWKf ehtyh; Fwpg;G jUf. | CO5 | R | 2 |
|  | <. | jhyhl;bd; ,ir tpsf;fk; jUf. | CO6 | R | 2 |
| c. | m. | jhyhl;L czh;j;Jk; jj;Jtk; tpsf;fk; jUf. | CO6 | R | 5 |
|  | M. | jhyhl;L gw;wp fl;Liu tiuf. | CO6 | R | 9 |

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|  | **COURSE OUTCOMES** |
| CO1 | **nrk;nkhopahk; jkpo; nkhopapd; rpwg;ig mwpe;Jnfhs;th;.** |
| CO2 | **Gj;jpyf;fpaq;fisg; gilf;Fk; jpwidAk; jpwdha;T nra;Ak; jpwidAk; ngWth;.** |
| CO3 | **ehl;Lg;Gwg;ghly;fis jpwdha;T nra;Ak; jpwid ngWjy;.** |
| CO4 | **jkpo;f; fhg;gpaq;fspy; moFk; mwpTzh;Tk; Cl;Lk; gFjpfisg; gbj;Jg; Ghpe;J nfhs;th;.** |
| CO5 | **gz;ila ,yf;fpag; gFjpfspy; cs;s goe;jkpohpd; MSikfisAk; milahsq;fisAk; mwpe;J nfhs;th;.** |
| CO6 | **Gjpdk; topj; jw;fhy rpf;fy;fisAk; mjw;fhd jPh;TfisAk; cUthf;Fk; jpwd; ngWth;.** |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 54 | 04 | - | - | - | - | 58 |
| CO2 | 42 | 03 | - | - | - | - | 45 |
| CO3 | 36 | 02 | - | - | - | - | 38 |
| CO4 | 00 | 00 | - | - | - | - | 00 |
| CO5 | 19 | 04 | - | - | - | - | 23 |
| CO6 | 16 | 00 | - | - | - | - | 16 |
|  | **167** | **13** |  |  |  |  | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **16LN2010** | **Duration :** | **3hrs** |
| **Course Name** | **HINDI-II** | **Max. Marks :** | **100** |

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome / Pattern** | **Marks** |
|  |  | **ANSWER ALL QUESTIONS**  **PART – A(4 X 20= 80 MARKS)** |  |  |
| 1. | a. | बारिश की रात पाठ के लेखक कौन है ? उनका जन्म कब हुआ ? | CO1/U | 2 |
|  | b. | इस पाठ के उद्देश्य क्या है ? | CO1/R | 2 |
|  | c. | आरा शहर के पुराना हाल और अब की हाल के बारे में लिखिए | | CO1/R | 3 |
|  | d. | उन्को क्या क्या पुरस्कार मिला ? | CO1/R | 3 |
|  | e. | इस पाठ के सारांश लिखिए | | CO1/R | 10 |
| **(OR)** | | | | |
| 2. | a. | रहीमजी का जन्म और मरण कब हुआ ? | CO1 /U | 2 |
|  | b. | उनके बारे में लिखिए | | CO1 / R | 2 |
|  | c. | उनकी प्रमुख कृतियाँ क्या क्या है ? | CO1 / R | 3 |
|  | d. | अहंकार के दमन के बारे में वे क्या कहते है ? | CO1 / R | 3 |
|  | e. | संयम ,बात बिगड़ने के बारे में , वे क्या बोलते है ? | CO1 / R | 10 |
|  |  |  |  |  |
| 3. | a. | माधवराव का जन्म कब और कहाँ हुआ ? | CO 2 / U | 2 |
|  | b. | उनका परिचय दीजिये | | CO2 / R | 2 |
|  | c. | युवकों को श्रम में अरुचि के बारे में लिखिए | | CO2 / R | 3 |
|  | d. | व्यवसाय की आवश्यकता के बारे में बताइए | | CO2 / R | 3 |
|  | e. | व्यवसाय छोडना ,आत्म प्रशंसा ,कर्त्तव्य पालन – समझाइए | | CO2 / R | 10 |
| **(OR)** | | | | |
| 4. | a. | तुकडोजी का जन्म और मरण कब हुआ ? | CO2 / U | 2 |
|  | b. | उनका परिचय दीजिये | | CO 2/ R | 2 |
|  | c. | उनकी प्रमुख कृतियाँ क्या क्या है ? | CO2 / R | 3 |
|  | d. | मूर्ख मित्र के बारे में लिखिए | | CO 2 / R | 3 |
|  | e. | कान की शोभा , उद्योगहीन आदमी, झूटी गवाही – समझावो | | CO2 / R | 10 |
|  |  |  |  |  |
| 5. | a. | मृत्युबोध के लेखक का नाम और उनका जन्म कब हुआ ? | CO3 / U | 2 |
|  | b. | त्यागीजी के कहानि का उद्देश्य क्या है ? | CO3 / R | 2 |
|  | c. | त्यागीजी की प्रमुख कृतियाँ क्या है ? | CO3 / R | 3 |
|  | d. | अस्पताल के डॉक्टर्स और नर्स इ बारे में लिखिए ? | CO 3 / R | 3 |
|  | e. | मृत्युबोद के कुछ और क्षण का सारांश लिखिए | | CO3 / R | 10 |
| **(OR)** | | | | |
| 6. | a. | एक कुता और मैना के लेखक कौन है ? | CO 3 / U | 2 |
|  | b. | उनका जन्म और मरण कब हुआ ? | CO3 / R | 2 |
|  | c. | द्वेदिजी का परिचय लिखिए | | CO 3 / R | 3 |
|  | d. | उनके प्रमुख कृतियाँ क्या है ? | CO 3 / R | 3 |
|  | e. | इस पाठ के सारांश लिखिए | | CO3 / R | 10 |
|  |  |  |  |  |
| 7. | a. | एक वृक्ष की हत्या के लेखक कौन है , उनका जन्म कब हुआ ? | CO4 / U | 2 |
|  | b. | उनकी प्रमुख कृतियाँ क्या है ? | CO4 / R | 2 |
|  | c. | कुंवर नारायणजी के बारे में लिखिये | | CO4 / R | 3 |
|  | d. | वे प्रकृति प्रेमी – ससमझाईये | | CO 4 / R | 3 |
|  | e. | सी कविता के सारांश लिखिए | | CO 4 / R | 10 |
| **(OR)** | | | | |
| 8. | a. | हंसिनी की भविष्यवाणी के लेखक कौन है? | CO4 / U | 2 |
|  | b. | मनमोहन मदरिया के बारे में लिखिए | | CO4 / R | 2 |
|  | c. | उनकी प्रमुख कृतियाँ क्या है ? | CO4 / R | 3 |
|  | d. | निसंतान रजा के बारे में लिखिए | | CO4 / R | 3 |
|  | e. | इस पाठ के सारांश लिखिए | | CO4 / R | 10 |
|  | | **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** : |  |  |
| 9. | c | संज्ञा और सर्वनाम के उदाहरण दीजिये | | CO 5 / R | 2 |
|  | b. | संज्ञा के परिभाषा दीजिये | | CO5 / R | 4 |
|  | c. | सर्वनाम के परिभाषा दीजिये | | CO5 / R | 4 |
|  | d. | शिक्षिका चाहिए – विज्ञापन दीजिये | CO6 / U | 5 |
|  | e. | अपने विद्यालय के पुस्तकालय को कुछ पुस्तकें मांगकर पत्र लिखिए | | CO6 / U | 5 |

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|  | **COURSE OUTCOMES** | | | | | | | |
| CO1 | सामान्य हिंदी को समजने की क्षमता | | | | | | | |
| CO2 | सामान्य गीतों को उचित से समजने की क्षमता | | | | | | | |
| CO3 | हिंदी के हंबिंद हल करने की क्षमता | | | | | | | |
| CO4 | हिंदी पड़ने की ,अपनी राय प्रकट करने की क्षमता | | | | | | | |
| CO5 | व्याकरण सहित बात करने की क्षमता | | | | | | | |
| CO6 | औपचरिक ,अनौपचारिक पत्रों ,फ़ॉर्मों को बरने की क्षमता | | | | | | | |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | | |
| CO / P | | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | | 2 | 18 | - | - | - | - | 20 |
| CO2 | | 2 | 18 | - | - | - | - | 20 |
| CO3 | | 2 | 18 | - | - | - | - | 20 |
| CO4 | | 2 | 18 | - | - | - |  | 20 |
| CO5 | | 10 | - | - | - | - | - | 10 |
| CO6 | |  | 10 | - | - | - | - | 10 |
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Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **17CA2006** | **Duration** | **3hrs** |
| **Course Name** | **DATABASE MANAGEMENT SYSTEMS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Explain the different components of Database System Architecture in detail. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe the purpose of database management system in detail. | CO2 | U | 10 |
|  | b. | Summarize the various types of users and database administrator in detail. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. |  | Develop the following query for the doctor table (Assume that,doctor table contains the following attributes:doc\_no, doc\_name,pat\_no,pat\_name, pat\_phno, pat\_fees).  a. Create a view called docview (view must contain pat\_no, pat\_name, pat\_phno,pat\_fees).  b. Insert a record into the docview.  c. Select all the record from the view  d. Update the fees as 50000, if the pat\_no is 100.  e. Delete a record from the docview. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Summarize the various queries of SQL. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Discuss the E-R model. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Develop an E-R diagram for Student Information System and discuss the same. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 7. |  | Illustrate the different types of normalizations in detail. | CO4 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Describe the deadlock handling in detail. | CO4 | U | 20 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain in detail the two-phase locking protocol. | CO5 | U | 10 |
|  | b. | Discuss trigger in detail. | CO5 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Differentiate database systems from file systems by enumerating the features provided by database systems and describe each in both function and benefit. |
| CO2 | Define the terminology, features, classifications, and characteristics embodied in database systems. |
| CO3 | Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram and other optional analysis forms, such as a data dictionary. |
| CO4 | Demonstrate with database design. |
| CO5 | Describe on transaction management. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 20 |  |  |  |  | 20 |
| CO2 |  | 20 |  |  |  |  | 20 |
| CO3 |  | 40 | 40 |  |  |  | 80 |
| CO4 |  | 20 | 20 |  |  |  | 40 |
| CO5 |  | 20 |  |  |  |  | 20 |
|  | | | | | | | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **17CA2024** | **Duration** | **3hrs** |
| **Course Name** | **NETWORK SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Discuss the taxonomy of security goals. | CO1 | U | 7 |
|  | b. | Classify the various security attacks. | CO1 | U | 13 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Explain the mathematics for cryptography in detail. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 3. | a. | Describe the P-Boxes in detail. | CO4 | U | 10 |
|  | b. | Explain the different properties of exclusive-or (XOR) operation. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss the key expansion in detail. | CO6 | U | 10 |
|  | b. | Discuss Pigeon hole principles. | CO6 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Describe in detail the AES. | CO6 | U | 10 |
|  | b. | Explain the different types of transformation in AES. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Draw the linear feedback register with 4 cells and 5 cells. | CO5 | A | 10 |
|  | b. | Solve the multiplicative inverse of 23 in Z100 | CO4 | A | 10 |
|  |  |  |  |  |  |
| 7. |  | Paraphrase the various real-world applications of digital signature. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Examine the various cryptosystem in detail. | CO4 | A | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Articulate the following concept in detail.  a. Message Authentication.  b. Random Oracle Model.  c. Pigeonhole Principle.  d. Birthday Problem. | CO2 | A | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Identify security threats and determine efforts to counter it. |
| CO2 | Familiarity with information security awareness and a clear understanding of its importance. |
| CO3 | Develop security algorithms in the network. |
| CO4 | Compare various cryptographic techniques. |
| CO5 | Design Secure applications. |
| CO6 | Define the terms vulnerability, threat and attack. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 40 |  |  |  |  | 40 |
| CO2 |  |  | 20 |  |  |  | 20 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 |  | 20 | 30 |  |  |  | 50 |
| CO5 |  |  | 10 |  |  |  | 10 |
| CO6 |  | 40 |  |  |  |  | 40 |
|  | | | | | | | **180** |

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| **Course Code** | **17CA2025** | **Duration** | **3hrs** |
| **Course Name** | **NETWORK COMPONENTS AND TROUBLESHOOTING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | | |
| 1. | | a. | Illustrate on the different types of network topology. | CO1 | U | 10 |
|  | | b. | Enumerate on the types of network architecture. | CO2 | R | 10 |
|  | |  | **(OR)** |  |  |  |
| 2. | | a. | Differentiate IPv4 and IPv6. | CO1 | An | 5 |
|  | | b. | Enumerate on link state and distance vector routing protocols. | CO2 | R | 15 |
|  | |  |  |  |  |  |
| 3. | | a. | Summarize on IP Subnet design. | CO1 | U | 10 |
|  | | b. | Explain in detail VLAN. | CO3 | U | 10 |
|  | |  | **(OR)** |  |  |  |
| 4. | | a. | Illustrate the working of DHCP. | CO4 | U | 10 |
|  | | b. | Explain in detail the different types of Network Address Translation. | CO5 | U | 10 |
|  | |  |  |  |  |  |
| 5. | | a. | Summarize Domain Name System. | CO5 | U | 10 |
|  | | b. | Summarize routers and routing table. | CO3 | U | 10 |
|  | |  | **(OR)** |  |  |  |
| 6. | | a. | Mention the different IP address classes along with corresponding subnet mask. | CO1 | R | 6 |
|  | | b. | Illustrate the steps in DNS lookup operation. | CO5 | U | 14 |
|  | |  |  |  |  |  |
| 7. | | a. | Summarize network device maintenance. | CO4 | U | 10 |
|  | | b. | Illustrate network device management. | CO4 | U | 10 |
|  | |  | **(OR)** |  |  |  |
| 8. | | a. | Illustrate on network device monitoring. | CO4 | U | 10 |
|  | | b. | Summarize on IDPS. | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | |
| 9. | | a. | Summarize on Wireshark protocol analyzer. | CO6 | U | 10 |
|  | | b. | Mention the steps in Wireshark packet analysis. | CO6 | R | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain data communications system and its components. |
| CO2 | Identify the different types of network topologies and protocols. |
| CO3 | Explain physical properties and characteristics of systems networking. |
| CO4 | Identify the different types of network devices and their functions within a network. |
| CO5 | Identify and describe the nature and roles of protocols and services at the application, network, data link, and physical layers. |
| CO6 | Solve network related problem. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 6 | 20 |  | 5 |  |  | 31 |
| CO2 | 25 |  |  |  |  |  | 25 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 |  | 40 |  |  |  |  | 40 |
| CO5 |  | 34 |  |  |  |  | 34 |
| CO6 | 10 | 20 |  |  |  |  | 30 |
|  | | | | | | | **180** |

Graphical user interface, application

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| **Course Code** | **17CA2058** | **Duration** | **3hrs** |
| **Course Name** | **CYBER CRIMES AND CYBER LAW** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain about computer hardware and networks. | CO1 | U | 10 |
|  | b. | List out the different types of computer memory and explain. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Summarize the following   1. Hard disks. 2. CD ROMs and DVD. | CO1 | U | 10 |
|  | b. | Explain different types of Networks. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe the type of cyber crime against individuals. | CO3 | U | 10 |
|  | b. | Explain the following   1. Cyber stalking. 2. Cyber defamation. 3. Identity theft. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain in detail about IT Act 2000 and its major amendments. | CO2 | U | 10 |
|  | b. | Summarize the following   1. Viruses. 2. Intellectual property. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Describe any three Cyber Crimes and punishments. | CO6 | U | 10 |
|  | b. | Explain the legal system of Information Technology. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain IP tracking and E-mail tracking. | CO3 | U | 10 |
|  | b. | Explain Cyber Terrorism with suitable illustration. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the provisions for protection of Online Trade Marks  under the Trade Marks Act, 1999.  Explain the provisions for protection of Online Trade Marks  under the Trade Marks Act, 1999.  Explain the provisions for protection of Online Trade Marks  under the Trade Marks Act, 1999.  Explain the provision for protection of Online Trade Marks under the Trade mark Act.1999. | CO2 | U | 10 |
|  | b. | What is electronic evidence? Explain the nature and  admissibility of electronic record.  Discuss the electronic evidences. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain about cyberspace. | CO5 | U | 10 |
|  | b. | Explain the procedure to follow the Digital Evidence Collection. | CO4 | U | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | 1. Define Search and Seizure of computers. 2. State the importance for recovery of deleted evidence. | CO5 | R | 10 |
|  | b. | Discuss any two Forensics tools. | CO5 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the history of computers and internet. |
| CO2 | Develop an appreciation for the developments in the field of computers. |
| CO3 | Understand the situation of cyber crimes and intellectual property rights. |
| CO4 | Acquire knowledge on tools used for investigation. |
| CO5 | Acquire knowledge on evidence collection and evidence preservation. |
| CO6 | Understand cyber crime investigation and evaluate various laws related to cyber crimes. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 30 | - | - | - | - | 30 |
| CO2 | - | 30 | - | - | - | - | 30 |
| CO3 | - | 50 | - | - | - | - | 50 |
| CO4 | - | 20 | - | - | - | - | 20 |
| CO5 | 10 | 20 | - | - | - | - | 30 |
| CO6 | - | 20 | - | - | - | - | 20 |
|  | | | | | | | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **17LN2005** | **Duration** | **3hrs** |
| **Course Name** | **TAMIL-I** | **Max. Marks** | **100** |

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| **Q. No.** | | **Questions** | | **Course Outcome** | | **Bloom’s Level** | | **Marks** | |
|  |  | | **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | |  | |  | |  |
| 1. | m. | | rpWfij kd;ddd; ---------------- | | CO3 | | U | | 1 |
|  | M. | | tPukhKdpth; vOjpa rpWfij ----------------- | | CO3 | | U | | 1 |
|  | ,. | | rpWfijapd; mbg;gil Nehf;fk; ahJ? | | CO3 | | R | | 2 |
|  | <. | | Ma;jk; ngah;f;fhuzk; jUf. | | CO1 | | R | | 2 |
| c. | m. | | rpWfijapd; ,yf;fzk; vOJf. | | CO3 | | R | | 5 |
|  | M. | | rpWfij Mrphpah;fs; gw;wp vOJf. 1. t.Nt.R.Iah; 2. fy;fp 3. GJikg;gpj;jd;. | | CO3 | | R | | 9 |
|  |  | | **(OR)** | |  | |  | |  |
| 2. | m. | | mir ------------ tifg;gLk;. | | CO1 | | U | | 1 |
|  | M. | | nky;ypd vOj;Jf;fs; MWk; -------------- gpwf;fpd;wd. | | CO1 | | R | | 1 |
|  | ,. | | vOj;Jf;fspd; ,lg;gpwg;G gw;wp vOJf. | | CO1 | | R | | 2 |
|  | <. | | Njk;ghtzp E}y; tpsf;fk; jUf. | | CO4 | | R | | 2 |
| c | m. | | Fws; ntz;ghit vLj;Jf;fhl;Lld; tpsf;Ff. | | CO1 | | R | | 5 |
|  | M. | | Ntypad; $Wk; ey;thh;j;ijfs; Fwpj;J fl;Liu vOJf. | | CO4 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 3. | m. | | filr;rq;f fhyj;jpd; ,Wjpapy; Njhd;wpa fhg;gpak; ----------- | | CO1 | | R | | 1 |
|  | M. | | jkpo; ,yf;fpaq;fs; ----------------- ,yf;fpaq;fs; vd miof;fg;gLfpwJ | | CO5 | | R | | 1 |
|  | ,. | | ntz;gh vj;jid tifg;gLk;? mit ahit? | | CO1 | | R | | 2 |
|  | <. | | rq;fk; kUtpa fhyk; Fwpg;G jUf. | | CO5 | | R | | 2 |
| c | m. | | ntz;ghtpd; nghJ ,yf;fzk; tpsf;fk; jUf. | | CO1 | | R | | 5 |
|  | M. | | jpiz Ik;ghy; kw;Wk; mtw;wpd; tpsf;fk; jUf | | CO1 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 4. | m. | | jk; fy;yiwapy; jk;ik xU jkpo; khztd; vd;W vOjr; nra;jth; ------------------- | | CO2 | | U | | 1 |
|  | M. | | fpwpj;jt fk;gh; vd;W miof;fg;gl;lth; ------------------ | | CO2 | | U | | 1 |
|  | ,. | | rPfd; ghy;F Iah; Fwpg;G jUf. | | CO2 | | R | | 2 |
|  | <. | | vl;Lj;njhif E}y;fs; ahit? | | CO5 | | R | | 2 |
| c. | m. | | rq;ffhyr; rpwg;G gw;wp Fwpg;G jUf. | | CO5 | | R | | 5 |
|  | M. | | jkpo; ,yf;fpa tuyhw;wpd; Ml;rpf; fhyq;fs; gw;wp vOJf. 1. gy;yth; fhyk; 2. Nrhoh; fhyk; 3. INuhg;gpah; fhyk; | | CO5 | | R | | 9 |
|  |  | | **(OR)** | |  | |  | |  |
| 5. | m. | | jkpo; fpwpj;jth;fSf;F topghl;by; gad;gLkhW ghliy vOjpath; ------------------- | | CO2 | | U | | 1 |
|  | M. | | vl;Lj;njhifapy; mfg;nghUSK; Gwg;nghUSk; Nrh;e;j E}y; -------- | | CO5 | | U | | 1 |
|  | ,. | | jj;Jtg;Nghjfh; Fwpg;G jUf. | | CO2 | | R | | 2 |
|  | <. | | FWe;njhif Fwpg;G jUf. | | CO5 | | R | | 2 |
| c. | m. | | vr;.V.fpUl;bzg;gps;is Fwpg;G jUf. | | CO2 | | R | | 5 |
|  | M. | | jkpo;ehl;L fpwpj;jth;fs; gw;wp vOJf. 1. Ntjehafk; rh];jphpahh; 2. Ntjehafk; gps;is. | | CO2 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 6. | m. | | $j;juhw;Wg;gil vd;Dk; E}ypd; kw;nwhU ngah;-------------- | | CO5 | | R | | 1 |
|  | M. | | neLe;njhif vd miof;fg;gLk; E}y; ---------------- | | CO5 | | R | | 1 |
|  | ,. | | neLey;thil Fwpg;G jUf. | | CO5 | | R | | 2 |
|  | <. | | ,aw;wkpo; - Fwpg;G jUf. | | CO3 | | R | | 2 |
| c. | m. | | mfehD}W Fwpg;G jUf. | | CO5 | | R | | 5 |
|  | M. | | vl;Lj;njhif E}y;fSs; Gwk; rhh;e;j E}y;fis vOJf. 1. gjpw;Wg;gj;J 2. GwehD}W | | CO5 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 7. | m. | | Gul;rpf;ftpQh; vd;W miof;fg;gl;lth; ------------------ | | CO3 | | U | | 1 |
|  | M. | | ctikf;ftpQh; vd;W miof;fg;gl;lth; ----------------- | | CO3 | | U | | 1 |
|  | ,. | | gj;Jg;ghl;L E}y;fs; ahit? | | CO5 | | R | | 2 |
|  | <. | | FwpQ;rpg;ghl;L Fwpg;G jUf. | | CO5 | | R | | 2 |
| c. | m. | | ew;wpiz Fwpg;G jUf. | | CO5 | | R | | 5 |
|  | M. | | gj;Jg;ghl;L Mw;Wg;gil E}y;fs; gw;wp vOJf. 1. jpUKUfhw;Wg;gil 2. nghUeuhw;Wg;gil | | CO5 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 8. | m. | | nrd;id muruit ftpQuhf tpsq;fpath; ---------------- | | CO3 | | U | | 1 |
|  | M. | | Njrpaf;ftp vd miof;fg;gl;lth; -------------------- | | CO3 | | U | | 1 |
|  | ,. | | ftpij xU ,yf;fpak; Fwpg;G jUf. | | CO3 | | R | | 2 |
|  | <. | | ftpkzp Njrpf tpehafk; gps;is Fwpg;G jUf. | | CO3 | | R | | 2 |
| c. | m. | | ehkf;fy; ftpQh; Fwpg;G jUf. | | CO3 | | R | | 5 |
|  | M. | | 20-Mk; E}w;whz;bd; ,izaw;w Gyth;fs; gw;wp vOJf. 1. ghujpahh; 2. ghujpjhrd; | | CO3 | | R | | 9 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | | | | |
| 9. | m. | | jkpo; tuyhw;Wg; Gjpdq;fspd; je;ij ----------------- | | CO3 | | U | | 1 |
|  | M. | | Kjy; tuyhw;Wg; Gjpdk; ------------- | | CO3 | | U | | 1 |
|  | ,. | | Nghyp vOj;Jf;fs; vd;why; vd;d? vj;jid tifg;gLk;? | | CO1 | | R | | 2 |
|  | <. | | gFgj cWg;Gfs; ahit? | | CO1 | | R | | 2 |
| c. | m. | | ty;ypdk; kpFk; ,lq;fis vLj;Jf;fhl;Lld; tpsf;Ff. | | CO1 | | R | | 5 |
|  | M. | | ehtypd; tiffis vOJf. | | CO3 | | R | | 9 |

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|  | **COURSE OUTCOMES** | | | | | | | |
| CO1 | **khzth;fs; r%f khw;wr; rpe;jidfis mwpe;Jnfhs;th;.** | | | | | | | |
| CO2 | **khzth;fs; Gjpdj;ijf; fw;gjd; %yk; rKjhar; rpf;fy;fis czh;e;J mtw;wpw;Fj; jPh;Tfhz;gh;.** | | | | | | | |
| CO3 | **ehlfq;fis r%fg; gad;ghl;bw;F Vw;g cUthf;Fk; jpwd; ngWth;.** | | | | | | | |
| CO4 | **jkpo;f; fhg;gpaq;fspy; moFk; mwpTzh;Tk; Cl;Lk; gFjpfisg; gbj;Jg; Ghpe;J nfhs;th;.** | | | | | | | |
| CO5 | **gz;ila ,yf;fpa gjpTfspy; cs;s goe;jkpohpd; MSikfisAk; milahsq;fisAk; mwpe;J nfhs;th;.** | | | | | | | |
| CO6 | **Gjpdk; topj; jw;fhy rpf;fy;fisAk; mjw;fhd jPh;TfisAk; cUthf;Fk; jpwd; ngWth;.** | | | | | | | |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | | |
| CO / P | | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | | 36 | 01 | - | - | - | - | 37 |
| CO2 | | 18 | 03 | - | - | - | - | 21 |
| CO3 | | 45 | 08 | - | - | - | - | 53 |
| CO4 | | 11 | 00 | - | - | - | - | 11 |
| CO5 | | 57 | 01 | - | - | - | - | 58 |
| CO6 | | 00 | 00 | - | - | - | - | 00 |
|  | | **167** | **13** |  |  |  |  | **180** |

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| **Course Code** | **17LN2006** | **Duration** | **3hrs** |
| **Course Name** | **TAMIL-II** | **Max. Marks** | **100** |

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| **Q. No.** | | **Questions** | | **Course Outcome** | | **Bloom’s Level** | | **Marks** | |
|  |  | | **ANSWER ALL QUESTIONS**  **PART – A(4 X 20= 80 MARKS)** | |  | |  | |  |
| 1. | m. | | Mz;lhd; jkpio --------------- vd;W Fwpg;gpLfpwhh;. | | CO1 | | R | | 1 |
|  | M. | | njhy;fhg;gpak; --------- gphpTfisf; nfhz;lJ. | | CO1 | | R | | 1 |
|  | ,. | | rq;fk; ngah; tpsf;fk; jUf. | | CO1 | | R | | 2 |
|  | <. | | ghapuj;jpd; nghJg;ngah;fs; ahit? | | CO1 | | R | | 2 |
| c. | m. | | fhtyh;fs; ghtyh;fs; Fwpg;G jUf. | | CO1 | | R | | 5 |
|  | M. | | Kr;rq;f tuyhW Fwpj;j nra;jpfis njhFj;J vOJf. | | CO1 | | R | | 9 |
|  |  | | **(OR)** | |  | |  | |  |
| 2. | m. | | #j;jpuk; ------------- tifg;gLk;. | | CO1 | | U | | 1 |
|  | M. | | E}y; --------------- tifg;gLk;. | | CO1 | | U | | 1 |
|  | ,. | | #j;jpuk; tpsf;Ff. | | CO1 | | R | | 2 |
|  | <. | | fPo;f;fzf;F E}y;fs; tpsf;fk; jUf. | | CO2 | | R | | 2 |
| c. | m. | | E}y; ngah;f;ffhuzk; jUf. | | CO1 | | R | | 5 |
|  | M. | | khzhf;fhpd; tifiaAk; khzhf;fh; Mfhjthpd; jd;ikiaAk; tpsf;Ff. | | CO1 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 3. | m. | | jphp vd;gjd; nghUs; ------------------ | | CO2 | | U | | 1 |
|  | M. | | Mrhuk; vd;gjd; nghUs; ---------------------- | | CO2 | | U | | 1 |
|  | ,. | | jpizkhiy E}w;iwk;gJ Fwpg;G jUf. | | CO2 | | R | | 2 |
|  | <. | | Nguhrphpah;. Re;juk;gps;is Fwpg;G jUf. | | CO5 | | R | | 2 |
| c. | m. | | ehybahh; Fwpg;G jUf. | | CO2 | | R | | 5 |
|  | M. | | ey;y Mrphpah; ,yf;fzKk;> mtw;wpd; jd;ikiaAk; tpsf;Ff. | | CO1 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 4. | m. | | Ie;jpiz mWgJ vd;w rpwg;gpidg; ngw;w E}y; ----------------- | | CO2 | | R | | 1 |
|  | M. | | gQ;rk; vd;gjd; nghUs; ---------------- | | CO2 | | U | | 1 |
|  | ,. | | 19-Mk; E}w;whz;bd; ehlf tiffs; ahit? | | CO5 | | R | | 2 |
|  | <. | | ciueil Fwpg;G jUf. | | CO2 | | R | | 2 |
| c. | m. | | Mrhuf;Nfhit Fwpg;G jUf. | | CO2 | | R | | 5 |
|  | M. | | ePjp E}y;fspy; mwk; gw;wpa E}y;fis vOJf. 1.jphpfLfk; 2. Vyhjp 3. rpWgQ;r%yk;. | | CO2 | | R | | 9 |
|  |  | | **(OR)** | |  | |  | |  |
| 5. | m. | | jkpo;nkhopapy; Njhd;wpa Kjy; ehlf E}y; ------------- | | CO5 | | R | | 1 |
|  | M. | | ehlftpay; vd;w E}iy vOjpath; --------------- | | CO5 | | R | | 1 |
|  | ,. | | fy;ntl;Lf;fs; Fwpg;G jUf. | | CO5 | | R | | 2 |
|  | <. | | goe;jkpo; ciueil E}y;fs; ahit? | | CO2 | | R | | 2 |
| c. | m. | | gonkhop Fwpg;G jUf. | | CO2 | | R | | 5 |
|  | M. | | jpUf;Fwspd; ngahf;fhuzKk; mjd; rpwg;gpay;GfSk; tpsf;Ff. | | CO2 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 6. | m. | | njd;dhl;L ngh;dhl;rh vd;W miof;fg;gl;lth; ------------ | | CO5 | | U | | 1 |
|  | M. | | ebg;Gf;fiy Mrhd; vd;W miof;fg;gl;lth; ----------------- | | CO5 | | U | | 1 |
|  | ,. | | jd;ikazp tpsf;fk; jUf. | | CO1 | | R | | 2 |
|  | <. | | fhtb Ml;lk; Fwpg;G jUf. | | CO3 | | R | | 2 |
| c. | m. | | jw;Fwpg;Ngw;w mzpia vLj;Jf;fhl;Lld; tpsf;Ff. | | CO1 | | R | | 5 |
|  | M. | | ehlfj;Jiw mwpQh;fs; gw;wp tpsf;fk; jUf. 1. rq;fujh]; Rthkpfs; 2. gk;ky; rk;ke;j Kjypahh;. | | CO5 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 7. | m. | | jPgfk; vd;gjd; nghUs; ------------------- | | CO1 | | U | | 1 |
|  | M. | | VJ vd;gjd; nghUs; ---------------------- | | CO1 | | U | | 1 |
|  | ,. | | Ntw;Wikazpia tpsf;Ff. | | CO1 | | R | | 2 |
|  | <. | | ngha;f;fhy; Fjpiu Ml;lk; tpsf;Ff. | | CO3 | | R | | 2 |
| c. | m. | | ry;ypf;fl;L Fwpg;G jUf. | | CO3 | | R | | 5 |
|  | M. | | $j;J gw;wp fl;Liu tiuf. 1. njUf;$j;J 2. fiof;$j;J 3. ghitf;$j;J. | | CO3 | | R | | 9 |
|  |  | | (OR) | |  | |  | |  |
| 8. | m. | | fufk; vd;gjd; nghUs; ------------------ | | CO3 | | U | | 1 |
|  | M. | | rf;if vd;gjd; nghUs; ----------------- | | CO3 | | U | | 1 |
|  | ,. | | fpl;bg;Gs; Fwpg;G jUf. | | CO3 | | R | | 2 |
|  | <. | | cr;rhpg;G tpisahl;L Fwpg;G jUf. | | CO3 | | R | | 2 |
| c. | m. | | ehl;Lg;Gwf; fiyapd; tsh;r;rp epiyfs; gw;wp tpsf;Ff. | | CO3 | | R | | 5 |
|  | M. | | ehl;Lg;Gw ehlfq;fs; gw;wp fl;Liu vOJf.1.gs;S ehlfk; 2. FwtQ;rp ehlfk; 3. nehz;b ehlfk;. | | CO3 | | R | | 9 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | | | | |
| 9. | m. | | jkpo;j;jhj;jh vd;W miof;fg;gl;lth; ----------------- | | CO5 | | U | | 1 |
|  | M. | | jkpoj;njd;wy; vd;W miof;fg;gl;lth; ------------------ | | CO5 | | U | | 1 |
|  | ,. | | MWKf ehtyh; Fwpg;G jUf. | | CO5 | | R | | 2 |
|  | <. | | jhyhl;bd; ,ir tpsf;fk; jUf. | | CO6 | | R | | 2 |
| c. | m. | | jhyhl;L czh;j;Jk; jj;Jtk; tpsf;fk; jUf. | | CO6 | | R | | 5 |
|  | M. | | jhyhl;L gw;wp fl;Liu tiuf. | | CO6 | | R | | 9 |

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|  | **COURSE OUTCOMES** |
| CO1 | **nrk;nkhopahk; jkpo; nkhopapd; rpwg;ig mwpe;Jnfhs;th;.** |
| CO2 | **Gj;jpyf;fpaq;fisg; gilf;Fk; jpwidAk; jpwdha;T nra;Ak; jpwidAk; ngWth;.** |
| CO3 | **ehl;Lg;Gwg;ghly;fis jpwdha;T nra;Ak; jpwid ngWjy;.** |
| CO4 | **jkpo;f; fhg;gpaq;fspy; moFk; mwpTzh;Tk; Cl;Lk; gFjpfisg; gbj;Jg; Ghpe;J nfhs;th;.** |
| CO5 | **gz;ila ,yf;fpag; gFjpfspy; cs;s goe;jkpohpd; MSikfisAk; milahsq;fisAk; mwpe;J nfhs;th;.** |
| CO6 | **Gjpdk; topj; jw;fhy rpf;fy;fisAk; mjw;fhd jPh;TfisAk; cUthf;Fk; jpwd; ngWth;.** |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 54 | 04 | - | - | - | - | 58 |
| CO2 | 42 | 03 | - | - | - | - | 45 |
| CO3 | 36 | 02 | - | - | - | - | 38 |
| CO4 | 00 | 00 | - | - | - | - | 00 |
| CO5 | 19 | 04 | - | - | - | - | 23 |
| CO6 | 16 | 00 | - | - | - | - | 16 |
|  | **167** | **13** |  |  |  |  | **180** |



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| **Course Code** | **19CA3002** | **Duration** | **3Hrs** |
| **Course Name** | **MACHINE LEARNING FOR IMAGE PROCESSING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Differentiate unsupervised and descriptive learning through suitable example. | CO1 | U | 10 |
|  | b. | Briefly discuss the ingredients of machine learning. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Create your own application based on decision trees in classification model. | CO2 | C | 20 |
|  |  |  |  |  |  |
| 3. | a. | Analyze the role of clustering in machine learning. | CO3 | An | 10 |
|  | b. | Briefly discuss any two rule-based models in machine learning. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Identify how perceptron’s and support vector machines are used in classification. | CO3 | R | 10 |
|  | b. | Write a note on ordered rule lists with suitable example. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. |  | Explain the probabilistic models used for modeling categorical data. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Differentiate between lossless and lossy compression through suitable example. | CO4 | U | 10 |
|  | b. | Discuss in detail about compression-basedmodels. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the process of getting the resolution of an image. | CO4 | U | 10 |
|  | b. | Analyze the need for image thresholding and gradients. | CO5 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate the process ofchanging brightness and contrast of images through suitable examples. | CO5 | A | 10 |
|  | b. | Write a note on Rotating, Shifting and Scaling of Images with suitable example. | CO4 | R | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Explain in detail about Detecting and Recognizing Faces in Image processing. | CO6 | U | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Recall the concepts used in machine learning. |
| CO2 | Identify the problems that can be solved using machine learning techniques. |
| CO3 | Identify the appropriate algorithms for solving problems. |
| CO4 | Explore the fundamentals of images and their processing. |
| CO5 | Apply machine learning techniques for problem solving. |
| CO6 | Apply machine learning for processing images. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 10 | 10 | - | - | - | - | 20 |
| CO2 | - | 10 | - | - | - | 20 | 30 |
| CO3 | 10 | 40 | - | 10 | - | - | 60 |
| CO4 | 10 | 20 | - | - | - | - | 30 |
| CO5 | - | - | 10 | 10 | - | - | 20 |
| CO6 | - | 20 | - | - | - | - | 20 |
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| **Course Code** | **20CA2002** | **Duration** | **3hrs** |
| **Course Name** | **PROBLEM SOLVING USING PROGRAMMING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the structure of C Program with an example. | CO1 | U | 10 |
|  | b. | List out the files used in C program. | CO1 | R | 5 |
|  | c. | Categorize the types of error. | CO1 | An | 5 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Compare the generations of a programming language. | CO1 | An | 10 |
|  | b. | Explain in detail about the basic data types in c. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Categorize the operators used in C programming language. | CO2 | An | 10 |
|  | b. | Write a program to implement input/output statements. | CO2 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Implement the switch-case statement. | CO3 | C | 10 |
|  | b. | Illustrate Functions with a program. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 5. |  | Define array. What are the types of an array? Illustrate with an example. | CO5 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Develop a C code to print all the even numbers from 1 to 50 using for loop. | CO3 | C | 10 |
|  | b. | Define Union. Explain in detail about UNION with an example. | CO6 | R | 10 |
|  |  |  |  |  |  |
| 7. |  | Appraise on the various string functions with examples. | CO5 | C | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Define Structures. Explain in detail the structures with an example program. | CO6 | R | 20 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain in detail anyone iterative statement with example. | CO3 | U | 10 |
|  | b. | Explain in detail the operations of files. | CO6 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Illustrate the basics of computers and programming language. |
| CO2 | Summarize about character sets and data types. |
| CO3 | Apply control structures in programming. |
| CO4 | Develop C programs to solve computational problems using functions. |
| CO5 | Construct C programs using arrays and strings. |
| CO6 | Develop C programs for solving problems using structures and union. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 5 | 10 |  | 15 |  |  | 30 |
| CO2 | 10 | 10 |  | 10 |  |  | 30 |
| CO3 |  | 10 |  |  |  | 20 | 30 |
| CO4 |  |  | 10 |  |  |  | 10 |
| CO5 | 20 |  |  |  |  | 20 | 40 |
| CO6 | 30 | 10 |  |  |  |  | 40 |
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| **Course Code** | **20CA2004** | **Duration** | **3hrs** |
| **Course Name** | **FUNDAMENTALS OF INFORMATION TECHNOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain in detail about desktop computer and its components. | CO1 | U | 10 |
|  | b. | Summarize the steps involved in data processing. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Discuss in detail about desktop computer and its components. | CO1 | C | 20 |
|  |  |  |  |  |  |
| 3. | a. | Describe MPEG compression standard. | CO2 | U | 10 |
|  | b. | Compare the physical devices used as storage cells | CO2 | E | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Illustrate the Interconnection of CPU with Memory and I/O Units. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Recall the concept of Database Management System. | CO4 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | What is Desktop Publishing? Explain. | CO5 | R | 20 |
|  |  |  |  |  |  |
| 7. |  | Explain the importance and applications of internet in detail. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Why Intellectual Property Rights (IPR) is important? Explain. | CO5 | R | 20 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Analyze the advantages and disadvantages of e-Commerce. | CO6 | A | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the different types of data. |
| CO2 | Understand data storage in the computer. |
| CO3 | Develop knowledge about the CPU, networks and output devices. |
| CO4 | Understand the database concepts. |
| CO5 | Acquire knowledge about data processing and the Internet. |
| CO6 | Learn about applying IT techniques for societal impact. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 20 |  |  |  | 20 | 40 |
| CO2 |  | 10 |  |  | 10 |  | 20 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 | 20 |  |  |  |  |  | 20 |
| CO5 | 40 | 20 |  |  |  |  | 60 |
| CO6 |  |  |  | 20 |  |  | 20 |
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| **Course Code** | **20CA2008** | **Duration** | **3hrs** |
| **Course Name** | **ESSENTIALS OF PYTHON PROGRAMMING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Describe the type of operators with suitable example. | CO1 | R | 15 |
|  | b. | Construct a program that prompts users to enter two integers x and y. Calculate and display the value of xy. | CO1 | A | 5 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain any ten string functions with suitable examples. | CO1 | U | 10 |
|  | b. | Summarize the history of python programming and its features. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Construct a program to calculate parking charges of a vehicle. Enter the type of vehicle as character (like c for car, b for bus etc.) and number of hours, then calculate the charges as given below:  Truck/bus - 20 Rs. per hour  Car - 10 Rs per hour  Scooter/Cycle/Motor Cycle- 5 Rs per hour | CO2 | A | 10 |
|  | b. | Construct a program to print all the even numbers between 1 to 50. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Illustrate the different forms of conditional statements with suitable example. | CO2 | A | 15 |
|  | b. | Compare break and pass statements. | CO2 | U | 5 |
|  |  |  |  |  |  |
| 5. | a. | Summarize the scope and life time of a variable with suitable example. | CO3 | U | 10 |
|  | b. | Illustrate the advantage of using function and explain different types of parameters passing with suitable example. | CO3 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Construct a program to calculate the biggest of three numbers using functions. | CO3 | A | 10 |
|  | b. | Apply recursion to find the factorial of a number. | CO3 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Create a list of first ten letters of the alphabet, then using the slice operations do the following operations.  i) Print the first three elements from the list.  ii) Print the last three elements from the list.  ii) Print the letters from any particular index to the end of the list. | CO4 | A | 10 |
|  | b. | Create a GUI using tkinter module. | CO6 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain tuples and its operations with example. | CO4 | A | 12 |
|  | b. | Summarize the advantage of using files and explain the modes used to handle the same. | CO4 | U | 8 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain the types of inheritance with examples. | CO5 | A | 12 |
|  | b. | Construct a program to read and write content to a file. | CO6 | A | 8 |

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the basics about python programming. |
| CO2 | Demonstrate the use of control flow statements in python. |
| CO3 | Develop modules for reusability of code. |
| CO4 | Infer the concept of collections in python. |
| CO5 | Illustrate object-oriented concepts. |
| CO6 | Make use of file handling concepts. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 15 | 20 | 5 | - | - | - | 40 |
| CO2 | - | 5 | 35 | - | - | - | 40 |
| CO3 | - | 10 | 30 | - | - | - | 40 |
| CO4 | - | 8 | 22 | - | - | - | 30 |
| CO5 | - | - | 12 | - | - | - | 12 |
| CO6 | - | - | 18 | - | - | - | 18 |
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| **Course Code** | **20CA2012** | **Duration** | **3hrs** |
| **Course Name** | **DATA STRUCTURES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain time and space complexity of algorithm with example. | CO1 | U | 10 |
|  | b. | Describe the classification of data structures. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Define algorithm and explain the different approaches for designing an algorithm. | CO1 | R | 10 |
|  | b. | Analyze and write a find routine in array implementation. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain the insertion operations of linked lists. | CO3 | U | 10 |
|  | b. | Describe the differences between singly and doubly linked lists. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Give an example for linked list application. | CO3 | U | 10 |
|  | b. | Discuss the advantages and disadvantages of linked lists and arrays. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Write an algorithm for push and pop operations on stack. | CO4 | A | 10 |
|  | b. | Explain the operation of EnQueue and DeQueue. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Write an algorithm for linear search with example. | CO5 | A | 10 |
|  | b. | Explain the tree traversal techniques with example. | CO6 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the various application of Graph. | CO6 | U | 10 |
|  | b. | Write an algorithm to implement selection sort with suitable example. | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain depth first and breadth first traversal. | CO6 | U | 10 |
|  | b. | Write an algorithm for binary search with example. | CO5 | A | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Write an algorithm for infix into postfix expression and Convert the expression A-(B/C+(D%E\*F)/G) infix into postfix expression. | CO4 | A | 10 |
|  | b. | Explain the quick sort algorithm with example. | CO5 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Outline the different ways of arranging and handling collection of data. |
| CO2 | Organize data in arrays and perform operations. |
| CO3 | Organize and manipulate data using linked lists. |
| CO4 | Organize and manipulate data using stacks and queues. |
| CO5 | Understand searching and sorting techniques. |
| CO6 | Organize and manipulate data in trees and graphs. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 10 | 20 | - | - | - | - | 30 |
| CO2 |  | 20 | 10 | - | - | - | 30 |
| CO3 | - | 30 | - | - | - | - | 30 |
| CO4 | - | - | 20 | - | - | - | 20 |
| CO5 | - | 10 | 30 | - | - | - | 40 |
| CO6 | - | 30 | - | - | - | - | 30 |
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| **Course Code** | **20CA2014** | **Duration** | **3hrs** |
| **Course Name** | **DATABASE MANAGEMENT SYSTEM** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Explain the different components of Database System Architecture in detail. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe the purpose of database management system in detail. | CO1 | U | 10 |
|  | b. | Summarize the various types of users and database administrator in detail. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. |  | Paraphrase about the relational algebra. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Discuss in detail the E-R Diagram. | CO2 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Demonstrate the extended E-R features in detail. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Categorize the different types of normalization. | CO2 | An | 15 |
|  | b. | Discuss the trigger with suitable example program. | CO6 | U | 5 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate the different types of transaction properties. | CO3 | A | 10 |
|  | b. | Draw the transaction state and brief the same. | CO3 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the Data Definition Language. | CO4 | A | 10 |
|  | b. | Discuss the Aggregation in detail. | CO4 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Develop a PL/SQL procedure for finding the sum of two numbers. | CO5 | A | 10 |
|  | b. | Develop a PL/SQL procedure for finding the greater of two numbers. | CO5 | A | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Evaluate business information problem and find the requirements of a problem in terms of data. |
| CO2 | Summarize about database schema and need for normalization. |
| CO3 | Design the database schema with the use of appropriate data types for storage of data in database. |
| CO4 | Use different types of physical implementation of database. |
| CO5 | Construct simple and moderately advanced database queries using Structured Query Language (SQL). |
| CO6 | Facilitate students to understand the concept of triggers. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 40 |  |  |  |  | 40 |
| CO2 |  | 40 |  | 15 |  |  | 55 |
| CO3 |  |  | 10 | 10 |  |  | 20 |
| CO4 |  | 30 | 10 |  |  |  | 40 |
| CO5 |  |  | 20 |  |  |  | 20 |
| CO6 |  | 5 |  |  |  |  | 5 |
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| **Course Code** | **20CA2018** | **Duration** | **3hrs** |
| **Course Name** | **BIG DATA ANALYTICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | List out Charactertics of structure, semi structures and unstructured data. | CO1 | R | 10 |
|  | b. | Explain in detail about data scientist. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | List out the top challenges faced in big data. | CO1 | R | 10 |
|  | b. | Explain the Hadoop ecosystem. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain with example for MongoDB. | CO4 | U | 10 |
|  | b. | Distinguish between SQL and NoSQL. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain Data Warehouse Environment. | CO3 | U | 10 |
|  | b. | Explain HDFS Deamons. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the YARN architecture with neat block diagram. | CO2 | U | 10 |
|  | b. | Discuss Partitions in hive. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the basics commands of HDFS. | CO3 | U | 10 |
|  | b. | Discuss the pig commands. | CO5 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Summarize reducer tasks phases. | CO6 | U | 10 |
|  | b. | Explain the different types of hive data units. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain with example of decision tree. | CO6 | U | 10 |
|  | b. | Explain sorting used in mapreduce. | CO6 | U | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Describe bucketing in hive. | CO5 | U | 10 |
|  | b. | Prepare MongoDB query for the following statements   1. create database student; 2. Show database; 3. use database 4. Create table student(sturollno INT,stuname STRING,batch STRING,year STRING); 5. describe student; | CO4 | A | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the fundamentals of Big data. |
| CO2 | Understand the concept of Hadoop. |
| CO3 | Develop solutions to problem using Big data. |
| CO4 | Acquire knowledge about MongoDB. |
| CO5 | Apply big data to solve real word problems. |
| CO6 | Illustrate the role of map reduce programming in various scenarios. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 | 10 |  | - | - | - | 30 |
| CO2 | - | 30 |  | - | - | - | 30 |
| CO3 | - | 30 |  | - | - | - | 30 |
| CO4 | - | 10 | 10 | - | - | - | 20 |
| CO5 | - | 40 |  | - | - | - | 40 |
| CO6 | - | 30 |  | - | - | - | 30 |
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Graphical user interface, application

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| **Course Code** | **20CA2023** | **Duration** | **3hrs** |
| **Course Name** | **MACHINE LEARNING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Classify the types of unsupervised learning algorithms. | CO1 | R | 10 |
|  | b. | Illustrate the following  i) Joining Numpy arrays.  ii) Numpy searching arrays. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain in detail the handwriting recognition system. | CO2 | U | 10 |
|  | b. | Summarize the concept behind the classification using sigmoid function. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain briefly the k-Nearest Neighbors algorithm. | CO2 | R | 10 |
|  | b. | Illustrate the steps in constructing a decision tree. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain in detail the dimensionality reduction techniques. | CO3 | R | 10 |
|  | b. | Explain the concept behind the association analysis using Apriori Algorithm. | CO3 | R | 10 |
|  |  |  |  |  |  |
| 5. | a. | Summarize the concepts of SVM. | CO4 | R | 10 |
|  | b. | Briefly discuss the k-means algorithm. | CO5 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the idea behind constructing a tree of annotations. | CO4 | U | 10 |
|  | b. | Classify the types of logistic regression. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate with an example to construct a classifier using naïve-Bayes classifier. | CO5 | U | 10 |
|  | b. | Explain in detail the locally weighted linear regression. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain briefly the classification and regression process using CART. | CO6 | R | 10 |
|  | b. | Describe the concept behind Principle Component Analysis. | CO6 | R | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Differentiate over fitting and under fitting of a model. | CO6 | U | 10 |
|  | b. | Given the customer rating of product x and y   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Person | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | X | 5 | 4 | 3 | 2 | 1 | 4 | 3 | 2 | | Y | 5 | 5 | 4 | 3 | 2 | 3 | 2 | 1 |   i) Find the best fit line.  ii) Predict the value of y if a customer rating is 4 in x. | CO5 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Define the terminologies of Machine learning. |
| CO2 | Describe the concepts of Naïve Bayes theory and decision trees. |
| CO3 | Apply the algorithm of Support vector machines and Logistic regression in the real time problems. |
| CO4 | Analyze the regression models. |
| CO5 | Design unsupervised Learning algorithms using k-means clustering and Association analysis. |
| CO6 | Modify the data using principal component and singular value decomposition. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 |  |  |  |  |  | 20 |
| CO2 | 10 | 20 |  |  |  |  | 30 |
| CO3 | 20 | 10 |  |  |  |  | 30 |
| CO4 | 20 | 10 |  |  |  |  | 30 |
| CO5 | 10 | 30 |  |  |  |  | 40 |
| CO6 | 20 | 10 |  |  |  |  | 30 |
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| **Course Code** | **20CA2025** | **Duration** | **3hrs** |
| **Course Name** | **DATA SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Describe security in the systems development life cycle in detail. | CO1 | R | 10 |
|  | b. | Explain the approaches to information security implementation. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Consider that you have a website for collecting customer information who search on specific jobs from certain sites. If a hacker hacks your website using the following type of threat, explain its impact and information loss. Also, explain the type of threat in detail.   1. A trojan horse via advertisement. 2. Data storage in unprotected area. 3. Default password for beginners. 4. Theft of an office laptop. 5. Outdated operating system. | CO1 | A | 10 |
|  | b. | Explain the broad classification of law in India and abroad in detail. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Does education play an important role in the ethics of customers and corporates in securing data? Justify your answer with an analysis on known security incidents. | CO2 | An | 10 |
|  | b. | Write notes on Information Security Planning and Governance in detail. | CO2 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | If one must assess the vulnerability of a Demilitarized Zone (DMZ) router, name the parameters that can be tested (Any FIVE). Brief on the possible vulnerabilities that may be uncovered for each parameter. | CO3 | A | 10 |
|  | b. | Explain any FIVE asset attributes to assess risk in detail (5 marks).  Explain the any FIVE types of biometrics and how biometrics can be used for further protection (5 marks). | CO3 | R | 10 |
|  |  |  |  |  |  |
| 5. | a. | Firewalls and Virtual Protection Networks help in protecting a network efficiently. Still, do you think it is essential to protect the environment with an additional budget for Intrusion detection and prevention? Justify your answer (6 marks). Suggest the possible action plan (4 marks). | CO4 | E | 10 |
|  | b. | Years before, in the mid of 2017, the economic times news journal published the following content in an article. Read the information and answer the questions below:  The Shadow Brokers, a team of brilliant hackers (allegedly with Russia's backing) penetrated systems of the US government to fish out hacking tools that are used by the American intelligence agencies and floated them on the web for other hackers to play around with. It's similar to some mischievous mind handing over a handful of nukes to a bunch of terrorists or tossing them in the open market for anyone to grab. We now know the outcome: those who misused the tools made a ransomware after infecting computers and systems ..    1. Do you think it is possible to re-do the same activity today, that is specified in the statement: “tossing them in the open market for anyone to grab”? Justify your answer. (2 marks) 2. Explain any TWO mechanisms that are designed to lure potential attackers away from critical systems (4 marks). 3. Deception toolkits are becoming popular today. Explain where they are required and why? (2 marks) 4. Is it technically possible to detect the location of the intruder? If possible, justify how. If not, justify why not. (2 marks) | CO4 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain how you can implement physical security control using the following mechanisms with appropriate examples:   1. Mantraps. 2. Electronic monitoring. 3. Alarms and alarm systems. 4. Computer rooms and wiring closets. 5. Security in interior walls and doors. | CO5 | A | 10 |
|  | b. | Write in detail on the technical aspects of implementing information security. | CO5 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain in detail on the positions/ professional ranks available in the information security domain. | CO6 | U | 10 |
|  | b. | Identify any TWO certifications required by information security professionals in the US (2 points). Explain how they must prepare themselves for security certification (3 points). List down the key knowledge required by the professionals (5 points). | CO6 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | List down any FIVE changes that may affect an organization’s information security environment. | CO6 | U | 10 |
|  | b. | Draw and explain the security maintenance model. | CO6 | R | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain risk identification components in detail. | CO3 | R | 10 |
|  | b. | Explain any FIVE types of risk control strategies. | CO3 | R | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Understand information security and the need for security. |
| CO2 | Define the issues, laws and policies in information security. |
| CO3 | Analyze the risks occur in information security. |
| CO4 | Apply the cryptography for needed circumstances. |
| CO5 | Analyze physical security in the day-to-day life. |
| CO6 | Create employment policies and practices. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 |  | 10 |  |  |  | 30 |
| CO2 | 10 | 10 |  | 10 |  |  | 30 |
| CO3 | 30 |  | 10 |  |  |  | 40 |
| CO4 |  |  |  | 10 | 10 |  | 20 |
| CO5 | 10 |  | 10 |  |  |  | 20 |
| CO6 | 10 | 20 | 10 |  |  |  | 40 |
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| **Course Code** | **20CA2027** | **Duration** | **3hrs** |
| **Course Name** | **PROFESSIONAL ETHICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Distinguish moral, morality, ethics and values through suitable example. | CO1 | U | 10 |
|  | b. | Ethical norms and standards are essentially contextual – Justify this statement through suitable example. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Briefly discuss the life skills through Australian, British and Canadian framework. | CO1 | U | 15 |
|  | b. | List and explain the competencies of a professional. | CO1 | R | 5 |
|  |  |  |  |  |  |
| 3. | a. | Discuss any two moral development theories in detail with suitable example. | CO2 | U | 14 |
|  | b. | Justify the uses of ethical theories. | CO2 | R | 6 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Classify the ethical theories with suitable example. | CO2 | An | 15 |
|  | b. | Differentiate moral relativism and moral pluralism. | CO2 | U | 5 |
|  |  |  |  |  |  |
| 5. |  | The Constitution of India guarantees certain rights to individuals. – Justify this statement with suitable examples. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | State and explain the responsibilities of a citizen. | CO4 | U | 10 |
|  | b. | Illustrate the rights of an employee and rights of a professional in detail through suitable examples. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Analyze the need for Corporate Social Responsibility among Indian corporates. | CO3 | An | 10 |
|  | b. | Discuss the code of ethics of any two professional bodies in detail. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Describe the procedure adopted for standardizing and benchmarking the ethics. | CO3 | U | 10 |
|  | b. | Recall the procedures for ethics audit. | CO3 | R | 10 |
| **PART – B (1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Identify the domains of learning based on human behavior. | CO5 | U | 10 |
|  | b. | List and explain the basic principles of ethical living. | CO6 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the basics of ethics and values. |
| CO2 | Solve professional problems using ethical codes. |
| CO3 | Analyze ethical codes and audit. |
| CO4 | Organize the life supporting ethics. |
| CO5 | Apply attitudes in the various situations of personal life. |
| CO6 | Illustrate the importance of the ethical standards in day-to-day lives. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 5 | 25 | 10 | - | - | - | 40 |
| CO2 | 6 | 19 | - | 15 | - | - | 40 |
| CO3 | 10 | 20 | - | 10 | - | - | 40 |
| CO4 | - | 30 | 10 | - |  |  | 40 |
| CO5 | - | 10 | - | - | - | - | 10 |
| CO6 | - | 10 | - | - | - | - | 10 |
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| **Course Code** | **20CA2028** | **Duration** | **3hrs** |
| **Course Name** | **PREDICTIVE ANALYTICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Compare the business intelligence vs predictive analytics. | CO1 | An | 10 |
|  | b. | Discuss the steps in the predictive analytics process. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Paraphrase about the descriptive modeling in detail. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 3. |  | Describe in detail the CRISP-DM. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Manipulate the data preparation in detail. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 5. | a. | Explain the logistic regression in detail. | CO4 | A | 10 |
|  | b. | Discuss the association rule mining. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Describe the decision tree with suitable examples. | CO4 | U | 10 |
|  | b. | Discuss the neural network in detail. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the text mining in detail. | CO5 | U | 10 |
|  | b. | Discuss in detail the regular expression. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Describe the ensemble methods that minimize variance. | CO5 | U | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Interpret the application of predictive analytics to solve real world problems. | CO6 | U | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Illustrate the steps involved in predictive analytics and modelling. |
| CO2 | Demonstrate data cleaning procedures and pre processing. |
| CO3 | Examine association rule mining and descriptive modelling for prediction. |
| CO4 | Utilize Machine learning in predictive analytics. |
| CO5 | Discover the role of ensembles and text mining methods. |
| CO6 | Apply predictive modelling for solving real world problems. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 30 |  | 10 |  |  | 40 |
| CO2 |  | 20 |  |  |  |  | 20 |
| CO3 |  | 30 |  |  |  |  | 30 |
| CO4 |  | 20 | 10 |  |  |  | 30 |
| CO5 |  | 40 |  |  |  |  | 40 |
| CO6 |  | 20 |  |  |  |  | 20 |
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| **Course Code** | **20CA2029** | **Duration** | **3hrs** |
| **Course Name** | **ARTIFICIAL INTELLIGENCE FOR DATA SCIENCE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Summarize different approaches of artificial intelligence. | CO1 | U | 10 |
|  | b. | Explain the types of agents with example. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Apply the PEAS approach in a vacuum cleaner. | CO2 | A | 12 |
|  | b. | List the advantages of artificial intelligence and its applications. | CO2 | U | 8 |
|  |  |  |  |  |  |
| 3. |  | Explain any two types of informed searching algorithm with example. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Describe any two types of uninformed searching algorithm with example. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 5. | a. | Sketch the software architecture of a robot car. | CO6 | A | 10 |
|  | b. | Illustrate the working of HMM algorithm with suitable example. | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Discuss the object recognition using vision. | CO4 | U | 10 |
|  | b. | Explain speech recognition in natural language processing. | CO5 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the functions used in artificial neural network. | CO3 | U | 8 |
|  | b. | Sketch a simple mathematical model for a neuron and explain about explanation-based learning. | C03 | A | 12 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Explain the commonly used network architectures in artificial neural network. | CO6 | U | 20 |
| **PART – B (1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Explain the types of learning and examine the working of a decision tree classifier. | CO4 | A | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Relate artificial intelligence to natural intelligence. |
| CO2 | Summarize problem solving techniques in games. |
| CO3 | Examine different forms of learning from nature. |
| CO4 | Utilize logic-based reasoning and learning. |
| CO5 | Discover the role of Artificial intelligence in natural languages. |
| CO6 | Inspect the applications of Artificial Intelligence in Diverse Fields. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 20 | - | - | - | - | 20 |
| CO2 | - | 8 | 12 | - | - | - | 20 |
| CO3 | - | 8 | 52 | - | - | - | 60 |
| CO4 | - | 10 | 20 | - | - | - | 30 |
| CO5 | - | 10 | 10 | - | - | - | 20 |
| CO6 | - | 20 | 10 | - | - | - | 30 |
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| **Course Code** | **20CA2030** | **Duration** | **3hrs** |
| **Course Name** | **OPERATING SYSTEMS SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Describe the structure of operating systems. | CO1 | R | 10 |
|  | b. | Illustrate the system components in detail. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the various design and implementation of OS. | CO2 | R | 10 |
|  | b. | Summarize the operations on process. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe in detail the communication that happens in client / server system. | CO3 | R | 10 |
|  | b. | Classify the system threads in detail. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain in detail the FCFS CPU Scheduling and round robin CPU scheduling algorithms. | CO3 | R | 10 |
|  | b. | Compare SJN and priority scheduling algorithm with example. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the concept of paging in OS. | CO4 | R | 10 |
|  | b. | Illustrate the concept behind segmentation in paging. | CO4 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Classify the importance of authentication. | CO6 | U | 10 |
|  | b. | Describe the operating systems input output hardware. | CO6 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Compare C-SCAN and Look disk Scheduling algorithms. | CO4 | U | 10 |
|  | b. | Explain in detail the FCFS disk scheduling algorithm and SSTF (shortest seek time first) algorithm. | CO4 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain in detail the memory management in Linux/Windows. | CO5 | R | 10 |
|  | b. | Illustrate the concept of OS security. | CO5 | R | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Summarize the difference between system software and application software. | CO1 | U | 10 |
|  | b. | Extract the structure of storage hierarchy. | CO2 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Describe the Operating System concepts. |
| CO2 | Explain the Operating Structure and Storage hierarchy. |
| CO3 | State process management. |
| CO4 | Show the capability in handling efficiently the Protection mechanism and the storage. |
| CO5 | Discuss the Operating System Security and Protection mechanism. |
| CO6 | Outline the kernel exploit. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 | 10 |  |  |  |  | 30 |
| CO2 | 10 | 20 |  |  |  |  | 30 |
| CO3 | 20 | 20 |  |  |  |  | 40 |
| CO4 | 30 | 10 |  |  |  |  | 40 |
| CO5 | 20 |  |  |  |  |  | 20 |
| CO6 | 10 | 10 |  |  |  |  | 20 |
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| **Course Code** | **20CA2031** | **Duration** | **3hrs** |
| **Course Name** | **CYBER CRIMES AND CYBER SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the roles of ECD and ICT in Cybercrime. | CO1 | U | 10 |
|  | b. | List out the strategies to prevent Cybercrime. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Recall the classification of Cybercriminals. | CO1 | R | 10 |
|  | b. | List out the challenges to mitigate the impact of Cybercrime. | CO1 | R | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain Cyber stalking with their handling and preventive measures. | CO2 | U | 10 |
|  | b. | Explain Cryptocurrency and its characteristics. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Describe Bitcoin and its transaction. | CO2 | R | 10 |
|  | b. | Explain Ethereum. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Recall Ransomware and kidnapping of information. | CO3 | R | 10 |
|  | b. | Explain Child Exploitation. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the traditional methods of proprietary information theft. | CO3 | U | 10 |
|  | b. | Explain Money Laundering. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | List out the Information Assurance fundamentals and explain them in detail. | CO4 | R | 10 |
|  | b. | Recall Symmetric Encryption. | CO4 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate DNS. | CO4 | U | 10 |
|  | b. | Explain Firewall and its workings. | CO4 | U | 10 |
| **PART B – (1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Describe Proxies and explain how it is used by attackers. | CO5 | R | 10 |
|  | b. | Illustrate SQL injection and explain how it is used by attackers. | CO6 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Categorize the changes in society associated with the advent of technological changes and the introduction of the internet. |
| CO2 | Explain computer-related crime. |
| CO3 | Develop a working knowledge of the classifications of motive for modern computer intruders and how they relate to each other in the digital security realm. |
| CO4 | Discuss the basic concepts of cryptographic technology and the major mathematical principles used by cryptographic systems. |
| CO5 | Describe the risks posed by the various types of malicious code objects and develop adequate countermeasures to protect the systems. |
| CO6 | Access and mitigate vulnerabilities. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 30 | 10 | - | - | - | - | 40 |
| CO2 | 10 | 30 | - | - | - | - | 40 |
| CO3 | 10 | 30 | - | - | - | - | 40 |
| CO4 | 20 | 20 | - | - | - | - | 40 |
| CO5 | 10 | - | - | - | - | - | 10 |
| CO6 | - | 10 |  |  |  |  | 10 |
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| **Course Code** | **20CA2032** | **Duration** | **3hrs** |
| **Course Name** | **INFORMATION SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Identify the fundamental components of information security. | CO1 | U | 10 |
|  | b. | Summarize the various eavesdropping attacks. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Analyze any five security issues and explain the risk mitigation measures. | CO1 | An | 20 |
|  |  |  |  |  |  |
| 3. | a. | Categorize the access control models and describe their functionality in restricting access to resources. | CO2 | An | 10 |
|  | b. | Explain the three ways in which access control can be implemented. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Categorize the access control techniques and explain their effectiveness in controlling access to resources. | CO2 | An | 20 |
|  |  |  |  |  |  |
| 5. | a. | Indicate how you can categorize sensitive data and arrange them in different levels. | CO3 | U | 10 |
|  | b. | Sketch the stages in the software development life cycle. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Identify the data roles and responsibilities in handling sensitive data. | CO3 | A | 10 |
|  | b. | Classify industries based on Capability Maturity Model and specify the features of each level. | CO4 | An | 10 |
|  |  |  |  |  |  |
| 7. |  | Categorize the types of firewalls and their deployment models and explain the working of each type. | CO5 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Discuss the best practices related to change management. | CO5 | U | 10 |
|  | b. | Explain the process of disaster recovery and business continuity planning. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Classify the classical ciphers and illustrate their working with suitable examples. | CO6 | An | 10 |
|  | b. | Illustrate the working of AES encryption algorithm. | CO6 | A | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain information security concepts and how they relate to one another helps security professionals design and implement secure systems. |
| CO2 | Apply various concepts, methodology, techniques and provide user access to resources. |
| CO3 | Classify information based on its value to the organization. |
| CO4 | Apply security in the software development life cycle and assess the effectiveness of software security. |
| CO5 | Discuss the ongoing, day-to-day management of security functions. |
| CO6 | Explain the basic terminology of cryptography and apply various key algorithms. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 20 |  | 20 |  |  | 40 |
| CO2 |  | 10 |  | 30 |  |  | 40 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 |  |  | 10 | 10 |  |  | 20 |
| CO5 |  | 20 |  | 20 |  |  | 40 |
| CO6 |  |  | 10 | 10 |  |  | 20 |
|  |  | 70 | 20 | 90 |  |  | **180** |

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| **Course Code** | **20CA2033** | **Duration** | **3hrs** |
| **Course Name** | **CYBER FORENSICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **Course Outcome** | **Bloom’s Level** | **Marks** | |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | | | |
| 1. | a. | | Explain the various phases in cyber forensics investigation process with neat diagram. | CO1 | R | 15 | |
|  | b. | | Classify the various states of data with suitable example. | CO1 | U | 5 | |
|  |  | | **(OR)** |  |  |  | |
| 2. | a. | | Summarize the fundamental principles of Cyber Forensics. | CO2 | U | 10 | |
|  | b. | | Describe about Locard’s Principle of Transference and Inman-Rudin Paradigm. | CO2 | R | 10 | |
|  |  | |  |  |  |  | |
| 3. | a. | | Classify digital evidence into four categories and brief them. | CO3 | U | 10 | |
|  | b. | | Explain the locations where the evidences reside. | CO3 | E | 10 | |
|  |  | | **(OR)** |  |  |  | |
| 4. | a. | | Illustrate various forms of data hiding such as Disk cleaning utilities, File wiping utilities and Disk degaussing. | CO4 | An | 10 | |
|  | b. | | Relate the various methods recommended by NIST in physical destruction of disk. | CO4 | A | 10 | |
|  |  | |  |  |  |  | |
| 5. | a. | | How to conduct forensics involving social media. Discuss types and applications of Social Networks. Discuss terms of service listed by social media such as Facebook and LinkedIn | CO5 | A | 15 | |
|  | b. | | Sketch a way to capture Direct Evidence of Crimes. | CO5 | An | 5 | |
|  |  | | **(OR)** |  |  |  | |
| 6. | a. | | Describe four types of partitions. Write notes on Net stat, Net session and open files. | CO2 | R | 10 | |
|  | b. | | Examine the cache maintained by Browsers (Chrome and Mozilla) and list out the forensic importance of it. | CO1 | E | 10 | |
|  |  | |  |  |  |  | |
| 7. | a. | | Correlate the various things which you observe by viewing packets using Wireshark. | CO3 | C | 8 | |
|  | b. | | Defend the need of authentication, and correlate the three types of authentication. | CO3 | E | 12 | |
|  |  | | **(OR)** |  |  |  | |
| 8. | a. | | Explain the various terms used in wireless networks. | CO6 | R | 8 | |
|  | b. | | Sketch and explain various web site attacks that happen in websites. | CO6 | A | 12 | |
| **PART – A(4 X 20= 80 MARKS)**  **COMPULSORY QUESTION** | | | | | | | |
| 9. | a. | | From original drive develop a way by which imaging can be done and tell the benefits of Hashing. | CO6 | C | 10 | |
|  | b. | | Defend how data can be safeguarded with RAID. Briefly explain various types of RAID. | CO6 | E | 10 | |
|  | | **COURSE OUTCOMES** | | | | |
| CO1 | | Describe cyber forensics and the knowledge required to do the forensic analysis. | | | | |
| CO2 | | Extend Scientific approaches to forensics that helps to identify, classify, locate and recover the evidence. | | | | |
| CO3 | | Choose and apply current cyber forensics tools. | | | | |
| CO4 | | Devise basic network forensic analysis. | | | | |
| CO5 | | Identify the emerging forensic technology. | | | | |
| CO6 | | Show the required knowledge and expertise to become a proficient forensic investigator. | | | | |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 15 | 5 |  |  | 10 |  | 30 |
| CO2 | 20 | 10 |  |  |  |  | 30 |
| CO3 |  | 10 |  |  | 22 | 8 | 40 |
| CO4 |  |  | 10 | 10 |  |  | 20 |
| CO5 |  |  | 15 | 5 |  |  | 20 |
| CO6 | 8 |  | 12 |  | 10 | 10 | 40 |
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| **Course Code** | **20CA2035** | **Duration** | **3hrs** |
| **Course Name** | **COMPUTER NETWORKS AND NETWORK SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | | |
| 1. | |  | Summarize on OSI model layers and functions. | CO1 | U | 20 |
|  | |  | **(OR)** |  |  |  |
| 2. | | a. | Compare and contrast the different types of firewall. | CO1 | An | 10 |
|  | | b. | Illustrate on the types of network architecture. | CO1 | U | 10 |
|  | |  |  |  |  |  |
| 3. | | a. | Explain in detail Ethernet frame format. | CO2 | U | 12 |
|  | | b. | Summarize on switch stacking. | CO3 | U | 8 |
|  | |  | **(OR)** |  |  |  |
| 4. | | a. | Explain in detail Spanning Tree Protocol. | CO3 | U | 10 |
|  | | b. | Enumerate on network and transport layer protocols. | CO2 | R | 10 |
|  | |  |  |  |  |  |
| 5. | | a. | Enumerate on different types of WAN topology. | CO4 | R | 10 |
|  | | b. | Illustrate the working of DHCP | CO5 | U | 10 |
|  | |  | **(OR)** |  |  |  |
| 6. | | a. | Explain in detail DNS lookup operation. | CO4 | U | 10 |
|  | | b. | Summarize on NAT. | CO5 | U | 10 |
|  | |  |  |  |  |  |
| 7. | | a. | Explain in detail access layer threat mitigation techniques. | CO5 | U | 10 |
|  | | b. | Illustrate the working of VPN. | CO5 | U | 10 |
|  | |  | **(OR)** |  |  |  |
| 8. | | a. | Enumerate on the types of IDS and IPS. | CO6 | R | 12 |
|  | | b. | Demonstrate on port security. | CO6 | U | 8 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | |
| 9. | | a. | Compare and contrast RIPv1 and RIPv2. | CO6 | An | 10 |
|  | | b. | Summarize on OSPF and EIGRP. | CO2 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Describe OSI and TCP/IP model, compare and contrast network topologies and also select the appropriate cabling type based on implementation requirements. |
| CO2 | Explain various router components, remotely access routers, and test network connectivity. |
| CO3 | Demonstrate a detailed knowledge of the operation and configuration of switches. |
| CO4 | Configure and understand the components and operation of a wireless LAN (WLAN). |
| CO5 | Demonstrate expertise in configuring host and network level technical security controls. |
| CO6 | Identify core networking and infrastructure components and design an IT infrastructure including devices, topologies, protocols, systems software, management, and security. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 30 |  | 10 |  |  | 40 |
| CO2 |  | 22 |  | 10 |  |  | 32 |
| CO3 |  | 18 |  |  |  |  | 18 |
| CO4 | 10 | 10 |  |  |  |  | 20 |
| CO5 |  | 40 |  |  |  |  | 40 |
| CO6 | 12 | 8 |  | 10 |  |  | 30 |
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| **Course Code** | **20CA2037** | **Duration** | **3hrs** |
| **Course Name** | **DATABASE SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Explain about the different types of normalization in detail. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Illustrate about the following concept in detail.   1. DDL. 2. DML. 3. Referential Integrity. 4. DBMS programming language interfaces. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 3. | a. | Point out the various operations for accessing file records. | CO3 | An | 8 |
|  | b. | Prioritize the lock based protocols. | CO3 | An | 12 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Paraphrase about the query processing. | CO2 | U | 10 |
|  | b. | Describe the various transaction state. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Dramatize the authentication technologies in healthcare. | CO3 | A | 10 |
|  | b. | Articulate the profile and password policies. | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Describe about the database security. | CO4 | U | 20 |
|  |  |  |  |  |  |
| 7. | a. | Demonstrate the various data auditing application. | CO5 | A | 10 |
|  | b. | Summarize the different types of recovery. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Paraphrase about the different types of backups in detail. | CO6 | U | 20 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Analyze about the different level of RAID in detail. | CO6 | An | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Design and develop database. |
| CO2 | Write efficient and complex queries. |
| CO3 | Identify proper authentication and authorization techniques for Database applications. |
| CO4 | Design multilevel security scheme for database. |
| CO5 | Perform database auditing and database performance tuning. |
| CO6 | Perform database backup and recovery. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  |  |  | 20 |  |  | 20 |
| CO2 |  | 10 | 20 |  |  |  | 30 |
| CO3 |  |  | 10 | 20 |  |  | 30 |
| CO4 |  | 30 |  |  |  |  | 30 |
| CO5 |  |  | 20 |  |  |  | 20 |
| CO6 |  | 30 |  | 20 |  |  | 50 |
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| **Course Code** | **20CA2039** | **Duration :** | **3hrs** |
| **Course Name** | **BIOMETRIC SECURITY** | **Max. Marks:** | **100** |

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Discuss the issues of traditional person identification systems and evaluate the effectiveness of biometrics in resolving such issues. | CO1 | An | 10 |
|  | b. | Summarize the characteristics of physiological biometric traits. | CO1 | U | 10 |
| **(OR)** | | | | | |
| 2. | a. | Explain any five behavioral biometric traits and their features. | CO1 | An | 10 |
|  | b. | Sketch the basic building blocks of biometric systems. | CO1 | A | 10 |
|  |  |  |  |  |  |
| 3. | a. | Demonstrate the working of finger print identification systems. | CO2 | A | 10 |
|  | b. | Describe the working official scan systems. | CO2 | U | 10 |
| **(OR)** | | | | | |
| 4. | a. | Illustrate the role of hand scan biometric systems in security-based applications. | CO2 | A | 10 |
|  | b. | Identify the strengths and weaknesses of signature scan systems. | CO2 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Recognize the components required for AFIS systems and demonstrate the working of AFIS systems. | CO3 | U | 10 |
|  | b. | Identify the strengths and weaknesses of keystroke scan systems. | CO4 | An | 10 |
| **(OR)** | | | | | |
| 6. | a. | Summarize the strengths and weaknesses of fingerprint scan systems. | CO3 | U | 10 |
|  | b. | Justify why the facial scan is the best-suited biometric trait for surveillance applications. | CO4 | E | 10 |
|  |  |  |  |  |  |
| 7. |  | Sketch the role of biometrics in customer-facing applications. | CO5 | A | 20 |
|  | | **(OR)** | | | |
| 8. |  | Defend the statement that biometrics can be an effective solution for time and attendance applications using any two case studies. | CO5 | E | 20 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Choose any two case studies of using behavioral biometrics in access control applications. Highlight the strengths and drawbacks of their implementation. | CO6 | E | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Describe the principles of biometric systems. |
| CO2 | Recognize the various modules constituting a biometric system. |
| CO3 | Explain different types of biometric traits. |
| CO4 | Analyze basic biometric system applications. |
| CO5 | Identify the sociological and acceptance issues associated with the design and implementation of biometric systems. |
| CO6 | Infer the challenges and limitations associated with biometrics. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 10 | 10 | 20 |  |  | 40 |
| CO2 |  | 10 | 20 | 10 |  |  | 40 |
| CO3 |  | 20 |  |  |  |  | 20 |
| CO4 |  |  |  | 10 | 10 |  | 20 |
| CO5 |  |  | 20 |  | 20 |  | 40 |
| CO6 |  |  |  |  | 20 |  | 20 |
|  |  | 40 | 50 | 40 | 50 |  | **180** |

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| **Course Code** | **20CA2041** | **Duration** | **3hrs** |
| **Course Name** | **MALWARE ANALYSIS AND ITS SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Classify the malicious programs based on their functionality and attack vectors. | CO1 | U | 12 |
|  | b. | List the goals of malware analysis its type. | CO1 | R | 8 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Summarize the popular malware analysis tools. | CO2 | U | 8 |
|  | b. | Inferhow hex Editor is used for cybercrime investigation. | CO2 | A | 12 |
|  |  |  |  |  |  |
| 3. | a. | Elaborate about the string extraction tools used in static analysis and write a python code to identify the file type. | CO2 | U | 12 |
|  | b. | Outline the concept of file obfuscation. | CO1 | U | 8 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Infer how to hide file extension in windows 10. | CO2 | A | 6 |
|  | b. | Illustrate about portable executable file. | CO2 | U | 14 |
|  |  |  |  |  |  |
| 5. | a. | Explain about dynamic malware analysis and the functionality of process hacker tool. | CO3 | U | 10 |
|  | b. | Outline the usage of yara tool and identify the file using yara rules. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Summarize about hashing a fingerprint for malware analysis. | CO3 | U | 12 |
|  | b. | Compare virus and worm and the types of compiled virus. | CO4 | U | 8 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate the advantage of using regshot tool for registry analysis. | CO3 | U | 10 |
|  | b. | Classify the malware using import hash. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | List the antimalware strategy and its challenges. | CO6 | R | 10 |
|  | b. | Outline different types of Brute Force Attacks and explain how to obtain the password. | CO5 | U | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Identify the heuristics techniques used to check suspicious domains. | CO5 | A | 10 |
|  | b. | Identify a file to be malicious or not using Wireshark and explain about whois and reverse ipwhois. | CO5 | A | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the concept of malware analysis, types of malware analysis and differentiate malware and a virus. |
| CO2 | Classify and compare the malware samples and Extract strings, functions, and metadata associated with the file. |
| CO3 | Use Dynamic analysis tools and understand their features, steps involved in dynamic analysis. |
| CO4 | Determine the possibilities that make experience with sandboxes and multi-AV scanners even better. |
| CO5 | Identify and correlate information regarding domains, hostnames and IP addresses. |
| CO6 | Discuss the challenges encountered in the field of malware analysis. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 8 | 20 | - | - | - | - | 28 |
| CO2 | - | 36 | 18 | - | - | - | 54 |
| CO3 | - | 30 | - | - | - | - | 30 |
| CO4 | - | 18 | - | - | - | - | 18 |
| CO5 | - | 20 | 20 | - | - | - | 40 |
| CO6 | 10 | - | - | - | - | - | 10 |
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| **Course Code** | | | | **20CA2042** | | **Duration** | | **3hrs** | |
| **Course Name** | | | | **SECURITY ASSESSMENT OF INFORMATION SYSTEMS THROUGH ETHICAL HACKING** | | **Max. Marks** | | **100** | |
| **Q. No.** | **Questions** | | | **Course Outcome** | | **Bloom’s Level** | | **Marks** | |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | | | | | |
| 1. | a. | Define Ethical Hacking. Describe few data breaches that has occurred. | | CO1 | | R | | 5 | |
|  | b. | Compare the activities of various types of hackers. | | CO1 | | An | | 15 | |
|  | | **(OR)** | | | | | | | |
| 2. | a. | Explain in detail about Risk. | | CO1 | | An | | 8 | |
|  | b. | Explain the security, functionality and usability triangle. | | CO1 | | An | | 6 | |
|  | c. | Describe the elements of Information Security. | | CO1 | | R | | 6 | |
|  |  |  | |  | |  | |  | |
| 3. |  | Explain the following   1. Viruses and its types c) Worms 2. Spy ware and Ad ware d) Session Hijacking | | CO2 | | U | | 20 | |
|  | | **(OR)** | | | | | | | |
| 4. | a. | Summarize how footprinting is done using social networking site. | | CO3 | | E | | 10 | |
|  | b. | Explain any 5 footprinting tools. | | CO3 | | An | | 10 | |
|  |  |  | |  | |  | |  | |
| 5. | a. | Define network scanning? What are different types of scanning? What are objectives of network scanning? | | CO3 | | R | | 8 | |
|  | b. | Explain the TCP connection establishment process. | | CO3 | | U | | 6 | |
|  | c. | Compare two scanning methodologies checking live systems and ping sweep. | | CO3 | | An | | 6 | |
|  | | **(OR)** | | | | | | | |
| 6. | a. | Define system hacking. Explain in detail about how various Operating systems are hacked. | | CO4 | | R | | 12 | |
|  | b. | Illustrate keyloggers. What are different types of keyloggers? | | CO4 | | A | | 8 | |
|  |  |  | |  | |  | |  | |
| 7. | a. | What is a web application? What are its components? Explain. | | CO4 | | R | | 6 | |
|  | b. | Explain how web server works. | | CO4 | | An | | 6 | |
|  | c. | List down web application threats and tools used for web attack. | | CO4 | | R | | 8 | |
|  | | **(OR)** | | | | | | | |
| 8. | a. | Define 802.11 Series and compare its various standards. | | CO5 | | A | | 3 | |
|  | b. | Explain the various types of Wi-Fi authentication process. | | CO5 | | An | | 12 | |
|  | c. | Recommend the ways for Securing Wireless Networks. | | CO5 | | E | | 5 | |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | | | | |
| 9. | a. | Summarize windows information gathering Phases. | | CO6 | | U | | 6 | |
|  | b. | Write any four Linux Information Gathering DNS Tools. | | CO6 | | C | | 8 | |
|  | c. | Write notes on RPC and Null sessions. | | CO6 | | C | | 6 | |

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|  | **COURSE OUTCOMES** |
| CO1 | Determine the security threats and vulnerabilities in computer networks using ethical hacking techniques. |
| CO2 | Identify various attacks in various domains of cyber space. |
| CO3 | Select the tools to gather the information regarding the vulnerabilities. |
| CO4 | Use techniques, skills and modern tools necessary to gather the information and to identify the vulnerabilities. |
| CO5 | Discuss about the exploits in various operating systems and Wireless environment. |
| CO6 | Identify the vulnerabilities associated with various network applications and database system. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 11 |  |  | 29 |  |  | 40 |
| CO2 |  | 20 |  |  |  |  | 20 |
| CO3 | 8 | 6 |  | 16 | 10 |  | 40 |
| CO4 | 26 |  | 8 | 6 |  |  | 40 |
| CO5 |  |  | 3 | 12 | 5 |  | 20 |
| CO6 |  | 6 |  |  |  | 14 | 20 |
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Graphical user interface, application

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| **Course Code** | **20CA2044** | **Duration** | **3hrs** |
| **Course Name** | **CYBER SECURITY GOVERNANCE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain corporate security in detail. | CO1 | R | 10 |
|  | b. | Specify the need of special intelligence for corporate security in a software company like TCS. Explain the roles in detail. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Identify and list down any FIVE cybersecurity threats you know. Give suitable examples. | CO1 | A | 10 |
|  | b. | List down any FIVE key benefits of establishing a sound cyber security governance to an organization and explain them. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain risk management in detail. | CO2 | R | 10 |
|  | b. | Have you read about the following incident? Observe the paragraph content and answer the following questions:  *“Europe’s biggest phone company identified hidden backdoors in the software that could have given Huawei unauthorized access to the carrier’s fixed-line network in Italy, a system that provides internet service to millions of homes and businesses… Vodafone asked Huawei to remove backdoors in home internet routers in 2011 and received assurances from the supplier that the issues were fixed, but further testing revealed that the security vulnerabilities remained.”*   1. Define backdoor. (2 marks) 2. Why did Vodafone ask Huawei to remove backdoors? (2 marks) 3. Explain what would happen if it was not removed (2 marks) 4. Was the backdoor intentionally created? How or why? (2 marks) 5. Explain vulnerability assessment and how it can be performed. ( 2 marks) | CO2 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | According to IDC, following is the prediction:  “India's public cloud services market to reach $10.8 bn by 2025”. This statement clearly views the associated security and operational risks in cloud.  **List** down the possible *security risks and operational risks* found in **cloud** and **explain** them. | CO2 | A | 10 |
|  | b. | Cyber security is no longer enough: businesses need cyber resilience. Explain why. Write notes on Cyber Resiliency Framework. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Discuss on the need of arranging for cybersecurity awareness campaigns for employees. | CO3 | U | 10 |
|  | b. | To provide effective training to employees, what kind of training materials can be prepared and delivered to employees? Explain them in detail. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Observe the following statements taken out of a survey conducted for small business organizations, and answer the questions given after each statement.   1. “46% of organizations fail to change security strategy after a cyber-attack”.Specify the possible reason. (2 marks) 2. “89 percent stated that IT infrastructure and critical data are not fully protected unless privileged accounts, credentials and secrets are secured”. Define login credentials. Why is that required? (2 marks) 3. “36 percent report that administrative credentials were stored in Word or Excel documents on company PCs”.What is wrong in storing administrative credentials in Word document? Why? (2 marks) 4. “Over 50% of small enterprises perceive themselves as too insignificant to face a cyber-attack. More than 40% of small enterprises lack cyber-attack prevention know-how”.Is that true that small business organizations will not be targeted by attackers? Why or why not? (2 marks) 5. List down the possible measures that can be taken to provide an understanding on cybersecurity prevention techniques, for small enterprises. (2 marks) | CO4 | An | 10 |
|  | b. | Define proactive threat monitoring.  Explain its need of implementation in IT companies. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Define COBIT. (2 marks)  List down and explain any FOUR principles of COBIT. (8 marks) | CO5 | R | 10 |
|  | b. | Compare and contrast COBIT with ITIL and TOGAF. (4 marks)  List down and explain any three benefits of security architecture. (6 marks) | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Describe in detail on strategy resources and constraints. | CO4 | R | 10 |
|  | b. | 1. Will cybersecurity fail without strategy? (1 mark) 2. Justify your answer with suitable examples. (5 marks) 3. What would be the future of cybersecurity in your perspective? (4 marks) | CO4 | A | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain Computer Security Act in the US. What is its equivalent in India? Explain it in detail. | CO6 | U | 10 |
|  | b. | Write notes on criminal law versus civil law in India, with suitable examples. | CO6 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the basics of cyber security governance. |
| CO2 | Develop an Information Security Strategy. |
| CO3 | State the need for resilience management. |
| CO4 | Describe the existing and emerging security strategy. |
| CO5 | Select a governing control or standards framework. |
| CO6 | Discuss the various compliance laws. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 10 | 10 | 20 | - | - | - | 40 |
| CO2 | 10 | - | 10 | 10 | - | - | 30 |
| CO3 | 10 | 20 | - | - | - | - | 30 |
| CO4 | 20 | - | 10 | 10 | - | - | 40 |
| CO5 | 10 | 10 | - | - | - | - | 20 |
| CO6 | - | 20 | - | - | - | - | 20 |
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| **Course Code** | **20CA2045** | **Duration** | **3hrs** |
| **Course Name** | **SECURITY OF WEB APPLICATIONS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the architecture of web application. | CO1 | U | 10 |
|  | b. | Describe the Secure Development life cycle. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain in detail the Cross site scripting. | CO2 | U | 10 |
|  | b. | Summarize the following   1. CSRF 2. CORS | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe in detail the SQL injection. | CO2 | U | 10 |
|  | b. | Explain the desirable features needed for Web Application Scanner**.** | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the different phases of Browser hacking methodology. | CO3 | U | 10 |
|  | b. | Describe Control Initiating Techniques. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the different types of authentication method for Web application. | CO4 | U | 10 |
|  | b. | Explain the following   1. ARP Spoofing 2. DNS prefetching | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Summarize the following   1. public key infrastructure 2. X.509 v3 Certificate | CO5 | U | 10 |
|  | b. | Describe front end and back end framework for Web application. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the different kinds of Web browser attack. | CO3 | U | 10 |
|  | b. | Illustrate the following   1. Breaking the authentication schemes 2. Document Author Identification Using PGP | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the different types of physical securities for web servers. | CO6 | U | 10 |
|  | b. | Describe the Deploying SSL Server Certificates. | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain the different ways of user attack. | CO3 | U | 10 |
|  | b. | Discuss the following   1. Identity Theft 2. Avoiding Spam and Junk Email | CO5 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain Web Application architecture and technologies. |
| CO2 | Identify and handle Web Application Attacks. |
| CO3 | Defend web browser from attacks. |
| CO4 | State the importance of web authentication and authorization. |
| CO5 | Exhibit privacy for users. |
| CO6 | Exhibit the skills in securing Web server. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 30 | - | - | - | - | 30 |
| CO2 | - | 40 | - | - | - | - | 40 |
| CO3 | - | 40 | - | - | - | - | 40 |
| CO4 | - | 20 | - | - | - | - | 20 |
| CO5 | - | 30 | - | - | - | - | 30 |
| CO6 | - | 20 | - | - | - | - | 20 |
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| **Course Code** | **20CA2046** | **Duration** | **3hrs** |
| **Course Name** | **DATA MINING IN CYBER SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | | |
| 1. | a. | Explain the components of data warehouse. | CO1 | U | 10 | |
|  | b. | Discuss the architecture of data warehouse. | CO1 | U | 10 | |
|  |  | **(OR)** |  |  |  | |
| 2. | a. | Paraphrase the aggregation in detail. | CO2 | U | 10 | |
|  | b. | Describe the decision tree with suitable example. | CO3 | U | 10 | |
|  |  |  |  |  |  | |
| 3. | a. | Explain the classification process. | CO3 | U | 10 | |
|  | b. | Discuss the issues regarding classification and prediction. | CO3 | U | 10 | |
|  |  | **(OR)** |  |  |  | |
| 4. |  | Represent the data mining techniques for privacy preservation and anomaly detection. | CO5 | U | 20 | |
|  |  |  |  |  |  | |
| 5. | a. | Discuss the examples of clustering applications. | CO4 | U | 10 | |
|  | b. | Describe the mining world wide web in detail. | CO4 | U | 10 | |
|  |  | **(OR)** |  |  |  | |
| 6. |  | Explain the partitioning methods in terms of clustering. | CO4 | U | 20 | |
|  |  |  |  |  |  | |
| 7. | a. | Classify the Data using naïve bayes classifier based on the following condition.  X = (age <=30,  Income = medium,  Student = yes,  Credit\_rating = Fair)  Solved In the table below there are 14 data with 4 | Chegg.com | CO3 | An | 15 | |
|  | b. | Describe the Bayesian classification. | CO3 | U | 5 | |
|  |  | **(OR)** |  |  |  | |
| 8. |  | Explain the malware attacks detection. | CO6 | U | 20 | |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | |
| 9. | a. | Discriminate the security applications by applying stream mining. | CO6 | An | 10 | |
|  | b. | Categorize the detecting remote exploits by applying Data Mining techniques. | CO6 | An | 10 | |

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|  | **COURSE OUTCOMES** | | | | | | | |
| CO1 | Explain various components and processes of data warehouse. | | | | | | | |
| CO2 | Design and implement Data Warehouse to industrial requirements. | | | | | | | |
| CO3 | Apply in association rule and classification technique in handling organizational problems. | | | | | | | |
| CO4 | Identify pattern and knowledge hidden in complex types of data. | | | | | | | |
| CO5 | Identify and handle anomaly detection in network. | | | | | | | |
| CO6 | Apply appropriate data mining technique in handling Malware attacks. | | | | | | | |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | | |
| CO / P | | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | |  | 20 |  |  |  |  | 20 |
| CO2 | |  | 10 |  |  |  |  | 10 |
| CO3 | |  | 35 |  | 15 |  |  | 50 |
| CO4 | |  | 40 |  |  |  |  | 40 |
| CO5 | |  | 20 |  |  |  |  | 20 |
| CO6 | |  | 20 |  | 20 |  |  | 40 |
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| **Course Code** | **20CA2047** | **Duration** | **3hrs** |
| **Course Name** | **EMAIL AND MOBILE FORENSICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the need for email investigation in detail (any five points). | CO1 | A | 10 |
|  | b. | Explain email architecture with a flow diagram. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | 1. Explain the psychology why a criminal intends to delete emails (3 marks). 2. List the type of information the criminals delete or try to hide (4 marks). 3. Also, explain how deleted emails help an investigator in identifying the criminal (3 marks). | CO1 | A | 10 |
|  | b. | Write notes on Email Activity Analysis Tool with suitable examples. | CO1 | R | 10 |
|  |  |  |  |  |  |
| 3. | a. | Discuss on the OS Forensics tool functionalities in detail. | CO2 | R | 10 |
|  | b. | Explain how file signatures and time stamps can be identified using hex editor with a suitable example. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain any FIVE methods of protecting your email from spoofing and forgery. | CO2 | U | 10 |
|  | b. | Elaborate on any TWO email forensic tools. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | We know that 81% of small businesses rely on email as their primary customer acquisition channel, and 80% for retention. Consider that you have a business for which email communication is primary and you own an email server. Now, answer the following questions:   1. How will you provide protection to your server from unauthorized usage? (3 marks) 2. Name any FOUR mechanisms that can prevent your server from being abused. (4 marks) 3. How will you maintain your connections and default settings? Explain. (3 marks) | CO3 | An | 10 |
|  | b. | Compare and contrast data in rest with data in transit. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | List down any TEN types of information that reside in a mobile device and state each of their purpose. | CO4 | A | 10 |
|  | b. | Write notes on SQLite Database. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | 1. Compare and contrast logical acquisition and file system acquisition. (4 marks) 2. How will you capture data using both the techniques? (6 marks) | CO5 | U | 10 |
|  | b. | 1. If the mobile device is severely damaged, which method is appropriate to acquire data: JTAG or Chip-off? Justify your answer. (4 marks) 2. Explain how data can be acquired from the memory chip. (6 marks) | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | 1. Describe on any THREE possible storage elements of an android phone in the form ofvolatile and non-volatile memory. (6 points) 2. Explain what constitutes the structure of an android phone memory. (4 points) | CO6 | A | 10 |
|  | b. | 1. List down the different types of mobile devices that use android operating system (3 marks). 2. If the android device is not obstructed and is with GSM and U (SIM) provisions, explain how you will acquire data from it. (4 marks). 3. What kind of challenges will you encounter, in this case? (3 marks) | CO6 | A | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Consider that you found a blackberry phone in the crime scene. Explain how you would **isolate the phone**, especially if the crime spot is identified after years of crime incident. | CO4 | A | 10 |
|  | b. | Observe the following email header and identify the important components and write any FIVE of them and explain their functionality.  (**Note**: Please turn over the page to find the remaining question) | CO2 | An | 10 |
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|  | **COURSE OUTCOMES** |
| CO1 | Explain the role of client and server in email and the role of email in investigation. |
| CO2 | Identify, analyze and investigate the malicious email. |
| CO3 | State the need to secure the e-mail service. |
| CO4 | Outline Mobile device proliferation and their functionalities. |
| CO5 | Identify and investigate data from mobile devices using forensically sound and industry standard tools. |
| CO6 | Analyze mobile devices, their backup files, and artifacts for forensic evidence. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 |  | 20 |  |  |  | 40 |
| CO2 | 10 | 30 |  | 10 |  |  | 50 |
| CO3 |  | 10 |  | 10 |  |  | 20 |
| CO4 | 10 |  | 20 |  |  |  | 30 |
| CO5 |  | 10 | 10 |  |  |  | 20 |
| CO6 |  |  | 20 |  |  |  | 20 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA2048** | **Duration** | **3hrs** |
| **Course Name** | **PYTHON FOR NETWORK AND SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain in detail the different authentication mechanisms. | CO2 | U | 10 |
|  | b. | Enumerate on the client-server methods in socket programming. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Demonstrate network traffic analysis using python code. | CO2 | U | 10 |
|  | b. | Illustrate on the methods available to interact with Secure Shell protocol. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Summarize on hashing using python. | CO3 | U | 10 |
|  | b. | Recall the python code to hack passwords. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Demonstrate man-in-the-middle attack using python. | CO3 | U | 10 |
|  | b. | Summarize on SHODAN search engine. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain in detail the image classification algorithms. | CO4 | U | 10 |
|  | b. | Recall the python code to flip, rotate and transpose image. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Summarize face recognition. | CO4 | U | 10 |
|  | b. | Summarize image restoration. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Enumerate the tools available for forensic analysis. | CO5 | R | 10 |
|  | b. | Explain in detail the usage of python for digital forensics. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate parsing log based artifacts in Linux. | CO5 | U | 10 |
|  | b. | Recall the python code to extract email from websites. | CO6 | R | 10 |
| **PART – A (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Enumerate the issues in web security. | CO6 | R | 8 |
|  | b. | Demonstrate AES encryption and decryption using python. | CO2 | U | 12 |

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|  | **COURSE OUTCOMES** |
| CO1 | Write socket program. |
| CO2 | Scan network and gather information. |
| CO3 | Perform ethical hacking. |
| CO4 | Encrypt and decrypt and validate images. |
| CO5 | Perform forensics analysis. |
| CO6 | Build ecommerce application. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 10 | 10 |  |  |  |  | 20 |
| CO2 |  | 32 |  |  |  |  | 32 |
| CO3 | 10 | 30 |  |  |  |  | 40 |
| CO4 | 10 | 30 |  |  |  |  | 40 |
| CO5 | 10 | 20 |  |  |  |  | 30 |
| CO6 | 18 |  |  |  |  |  | 18 |
|  | | | | | | | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **20CA2050** | **Duration** | **3hrs** |
| **Course Name** | **CLOUD SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Identify the essential characteristics of cloud computing and explain their role in cloud computing. | CO1 | U | 10 |
|  | b. | Summarize the technological influences that enabled the emergence of cloud computing. | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain any five cloud services and their applications in real-time. | CO1 | U | 10 |
|  | b. | Analyze the role of the following technologies in cloud computing.   1. Autonomic computing. 2. Virtualization.   iii. Utility computing.  iv. Service Oriented Architecture. | CO1 | An | 10 |
| 3. | a. | Describe the four deployment models of cloud computing and their features. | CO2 | U | 10 |
|  | b. | Examine the dimensions of the Jericho cloud cube model of cloud computing. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Summarize the benefits of cloud computing. | CO2 | U | 10 |
|  | b. | Identify any five breaches against the confidentiality of information. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Illustrate the various eavesdropping attacks and explain their impact on data security. | CO3 | A | 10 |
|  | b. | Identify the areas of risks associated with virtualized systems. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the following attacks on a cloud scenario:   1. Man-in-the-middle attack. 2. War Walking. 3. Session hijacking attack. 4. Denial of Service attacks. 5. IP Spoofing. | CO3 | U | 10 |
|  | b. | Identify the attacks against the availability of data and explain their impact on systems. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate how virtual private networks can be used to provide secure communication in a cloud-based system. | CO4 | A | 10 |
|  | b. | Explain the methods used for retiring or destroying sensitive information. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Examine the risks specific to hypervisors. | CO4 | A | 10 |
|  | b. | Organize the phases of the incident response lifecycle. | CO5 | An | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Discuss the issues raised by virtualization and data location. | CO6 | U | 10 |
|  | b. | Analyze the need for IT governance in cloud computing. | CO6 | An | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Compare the deployment models versus service models of cloud computing. |
| CO2 | Illustrate the architecture and categorize the services using cloud computing. |
| CO3 | Identify the known threats, risks, vulnerabilities and privacy issues associated with cloud-based IT services. |
| CO4 | Explain the concepts and guiding principles for designing and implementing appropriate safeguards and countermeasures for cloud-based IT services. |
| CO5 | Describe the industry security standards, regulatory mandates, audit policies, and compliance requirements for cloud-based infrastructures. |
| CO6 | State the governance in the cloud. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 30 |  | 10 |  |  | 40 |
| CO2 |  | 30 | 10 |  |  |  | 40 |
| CO3 |  | 30 | 10 |  |  |  | 40 |
| CO4 |  |  | 20 |  |  |  | 20 |
| CO5 |  | 10 |  | 10 |  |  | 20 |
| CO6 |  | 10 |  | 10 |  |  | 20 |
|  |  | 110 | 40 | 30 |  |  | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **20CA2052** | **Duration** | **3hrs** |
| **Course Name** | **INFORMATION SECURITY ETHICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Describe ethical consideration in Information technology. | CO1 | R | 10 |
|  | b. | Illustrate ethics for IT professionals. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Illustrate the ethics on internet of things. | CO3 | U | 10 |
|  | b. | Summarize the history of media. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Describe in detail ethics and internet. | CO3 | R | 10 |
|  | b. | Classify the anonymity issues in privacy. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Describe the trade secrets and the ethics that should be followed in trades. | CO4 | R | 10 |
|  | b. | Illustrate the ethics that should be followed in intellectual property rights. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain in detail about ISC2 code of ethics. | CO5 | R | 10 |
|  | b. | Illustrate the principles that should be followed in personnel security. | CO5 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Classify the importance of software quality. | CO6 | U | 10 |
|  | b. | Describe the capability maturity model integration. | CO6 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Identify the ethics followed in business world. | CO1 | U | 10 |
|  | b. | Summarize the concepts behind the development of safety in critical systems. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain in detail the ethics followed in patents. | CO4 | R | 10 |
|  | b. | Illustrate the ethics for IT users. | CO1 | R | 10 |
| **PART – B (1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Summarize the ethics that should be followed on the usage of smartphone. | CO2 | R | 10 |
|  | b. | Extract the concept behind the ethics in the development of robots. | CO2 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Identify the issues of professional conduct in information technology. |
| CO2 | Analyses the relationship with machines, and in particular with the technological devices that we  use most in our everyday communication. |
| CO3 | Assess the impact of the privacy laws. |
| CO4 | Illustrate the issues related to intellectual property. |
| CO5 | Adapt several codes of ethics, from general to specific in nature. |
| CO6 | State the ethical issues that the software manufacturers face in making trade-offs between project  Schedules, project costs, and software quality. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 | 10 |  |  |  |  | 30 |
| CO2 | 10 | 10 |  |  |  |  | 20 |
| CO3 | 10 | 20 |  |  |  |  | 30 |
| CO4 | 30 | 20 |  |  |  |  | 50 |
| CO5 | 20 |  |  |  |  |  | 20 |
| CO6 | 20 | 10 |  |  |  |  | 30 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA3001** | **Duration** | **3hrs** |
| **Course Name** | **CYBER CRIMINOLOGY AND CRIMINAL JUSTICE ADMINISTRATION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Define cyber crime and explain the different types of cyber-crime. | CO1 | R | 10 |
|  | b. | State and explain the Juvenile Offenders. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe the Profiling of Cyber criminals. | CO2 | U | 10 |
|  | b. | Explain the different Modus operandi used by Cyber criminals. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | List the need for Penetration Testing and explain the Phases of Penetration Testing. | CO2 | R | 10 |
|  | b. | Explain the Tools and Techniques used in Cyber criminals. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss the following crimes i. Hacking ii. Cracking iii. Stalking | CO3 | U | 10 |
|  | b. | Explain about online marketing fraud. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Describe the following crimes   1. IPR related fraud 2. Social Engineering 3. Data Diddling | CO3 | R | 10 |
|  | b. | Describe Bank, telecom fraud. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the Charity Fraud. | CO4 | U | 10 |
|  | b. | Describe Routine activities theory. | CO5 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain about Psychological theories related to cyber criminals. | CO5 | U | 10 |
|  | b. | Describe the structure of police in India. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | State and explain the procedure for Administration of Criminal Justice. | CO6 | R | 10 |
|  | b. | Explain the Tribunal System in India. | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain the court system in India. | CO6 | U | 10 |
|  | b. | Summarize the following   1. First Information Report (FIR). 2. Cognizable and non Cognizable offence. | CO6 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the concept of crime and cyber crimes. |
| CO2 | Outline the principle of crime, cause and extent of cyber crimes. |
| CO3 | Discuss various forms of cyber crimes. |
| CO4 | Debate the cyber frauds happening in the major sectors such as Banking sector, Telecom sector, Health sector, Travel sector. |
| CO5 | Give the theoretical perspectives of cyber crimes. |
| CO6 | Describe the role of Criminal Justice Administration and cyber crimes. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 | - |  |  |  |  | 20 |
| CO2 | 10 | 30 |  |  |  |  | 40 |
| CO3 | 10 | 10 |  |  |  |  | 20 |
| CO4 | - | 30 |  |  |  |  | 30 |
| CO5 | - | 20 |  |  |  |  | 20 |
| CO6 | 10 | 40 |  |  |  |  | 50 |
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Graphical user interface, application

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| **Course Code** | **20CA3002** | **Duration** | **3hrs** |
| **Course Name** | **INFORMATION SECURITY MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the seven domains of typical IT infrastructure. | CO1 | R | 10 |
|  | b. | Explain about the weakest link in the security of an IT infrastructure. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Discuss in detail on the data classification standards. | CO2 | U | 10 |
|  | b. | How would you rate the advantages and disadvantages of information security? Do you think it is feasible to provide an error-free secure applications? Justify your answer. | CO1 | E | 10 |
|  |  |  |  |  |  |
| 3. | a. | Are modern storage systems secure? Justify your answer with suitable examples. | CO2 | A | 10 |
|  | b. | Elaborate on personnel security in detail. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain how security has taken several transformations from encryption to IRM. | CO3 | R | 10 |
|  | b. | Explain in detail on authentication and privacy. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Elaborate on how privacy can be maintained in the web. | CO4 | U | 10 |
|  | b. | Emerging technologies impact heavily on the privacy of the users: Do you agree with this statement? Justify your answer. | CO4 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain in detail on the access control types. | CO5 | R | 10 |
|  | b. | Demonstrate on the effects of security breaches in access control. | CO5 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Compare and contrast RADIUS and TACACS based on their features. | CO5 | E | 10 |
|  | b. | Write notes on centralized versus decentralized access control. | CO5 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain how security administration can be made efficiently. | CO6 | U | 10 |
|  | b. | Explain the role of security in software development. | CO6 | R | 10 |
| **PART – B (1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Demonstrate on the methods of identifying threats and vulnerabilities in an online food application like Swiggy. | CO6 | An | 10 |
|  | b. | Explain in detail on risk management techniques. | CO6 | R | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the fundamental concepts of information security. |
| CO2 | Describe the need for development of information security policies, and identify guidelines and  models for writing policies. |
| CO3 | Outline how the organization has to equip itself for effective implementation of information  security. |
| CO4 | Relate the importance of privacy and how they impact the information security. |
| CO5 | State the importance of access controls and the need for an access control. |
| CO6 | Recommend suitable controls and procedures for ensuring security. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 10 | 10 |  |  | 10 |  | 30 |
| CO2 |  | 10 | 10 |  |  |  | 20 |
| CO3 | 10 | 10 |  |  |  |  | 20 |
| CO4 |  | 20 |  | 10 |  |  | 30 |
| CO5 | 20 |  | 10 |  | 10 |  | 40 |
| CO6 | 20 | 10 |  | 10 |  |  | 40 |
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| **Course Code** | **20CA3003** | **Duration** | **3hrs** |
| **Course Name** | **NETWORK SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Explain in detail about OSI reference model. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Describe the concept of Virtual Local Area Network (VLAN) and Network Address Translation. | CO1 | R | 20 |
|  |  |  |  |  |  |
| 3. |  | Explain in detail about Transport layer protocols. | CO2 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Articulate the concepts of EIGRP. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 5. |  | Explain in detail about Cryptography and its types. | CO4 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Describe in detail about Kerberos. | CO5 | R | 20 |
|  |  |  |  |  |  |
| 7. |  | Review the concepts of IP Security. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Describe in detail about Intrusion Detection and Prevention Systems. | CO6 | R | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Explain in detail about Common TCP/IP applications. | CO2 | U | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Define the concepts of protocols and their relationship to each other. |
| CO2 | Explain different network types, IP address, sub-netting, network address translation and IP versions 4 to IPv6. |
| CO3 | Identify the various TCP/IP protocols used for the networking application. |
| CO4 | Demonstrate routing protocols used for different networks. |
| CO5 | Comprehend the cryptography concepts. |
| CO6 | Evaluate network and internet security. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 | 20 |  |  |  |  | 40 |
| CO2 | 20 | 20 |  |  |  |  | 40 |
| CO3 |  |  | 20 |  |  |  | 20 |
| CO4 |  |  | 20 |  |  |  | 20 |
| CO5 | 20 |  | 20 |  |  |  | 40 |
| CO6 | 20 |  |  |  |  |  | 20 |
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| **Course Code** | **20CA3005** | **Duration** | **3hrs** |
| **Course Name** | **CYBER LAW** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Define Cyber Space. Describe the evolution of Cyber Space. | CO1 | R | 10 |
|  | b. | Elaborate the salient features of Information Technology (Amendment) Act 2008. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Highlight the features of computers and Internet technology | CO1 | R | 10 |
|  | b. | Describe Jurisdiction with its types | CO2 | A | 10 |
|  |  |  |  |  |  |
| 3. | a. | Discuss about any five section of IT ACT 2000. | CO2 | U | 10 |
|  | b. | Differentiate Data Privacy and Data Protection | CO4 | A | 10 |
|  |  |  |  |  |  |
| 4. | a. | Describe the power of Cyber Appellate Tribunal. | CO5 | U | 10 |
|  | b. | Outline the use of hashing function. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain UNCITRAL Model law | CO5 | R | 10 |
|  | b. | Sketch about E-Contracts | CO3 | AP | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Sketch the creation of Digital Signature | CO5 | AP | 10 |
|  | b. | Display the Cloud of Electronic Health Record | CO2 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the function and Cyber Investigation | CO3 | U | 10 |
|  | b. | Outline the problems of Virus attack | CO4 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Discuss about Framing | C06 | AP | 10 |
|  | b. | Explain the copyright issues in cyberspace. | C05 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Discuss about Cyber Stalking | CO6 | U | 10 |
|  | b. | Describe TypoSquatting with its types. Compare with Cybersquatting | CO6 | R | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Learn techno-legal regulations of the Internet. |
| CO2 | Outline the overall regulatory framework of cyber space in India and developing countries. |
| CO3 | Develop the understanding of relationship between commerce and cyberspace. |
| CO4 | Understand the Information Technology Act and legal framework of right to Privacy, Data Security and Data Protection. |
| CO5 | Analyze the legal constraints in the enforceability of IT Act and related legislations. |
| CO6 | Understand the tools in cyber forensics, cyber investigation and also relate to other contemporary issues like law relating to cloud technology, Block chain and crypto currencies in India. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 |  |  |  |  |  | 20 |
| CO2 |  | 10 |  | 20 |  |  | 30 |
| CO3 |  | 10 | 10 |  |  |  | 20 |
| CO4 | 10 | 10 |  | 20 |  |  | 40 |
| CO5 | 20 | 10 | 10 |  |  |  | 40 |
| CO6 | 10 | 10 | 10 |  |  |  | 30 |
|  | | | | | | | **180** |



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| **Course Code** | **20CA3006** | **Duration** | **3hrs** |
| **Course Name** | **DIGITAL FORENSICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Classify the various types of number system. Write the steps to explain how a letter is converted to binary form and back?  Convert Binary to Decimal  1. (1111)2= (?)10  2. (1001)2= (?)10  Convert decimal 35 and 55 to binary | CO1 | R | 15 |
|  | b. | Interpret the basic principles of Cyber Forensics. | CO1 | U | 5 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Write the steps by which USB drives can be blocked from writing. | CO2 | U | 5 |
|  | b. | Briefly discuss about file system. A) Naming files B) File extensions C) Accessing a file D) File attributes | CO2 | R | 15 |
|  |  |  |  |  |  |
| 3. | a. | Briefly discuss about importance of Recycle Bin, Temp files and Thums.DB. | CO3 | U | 15 |
|  | b. | Sketch and examine the cache maintained by Browsers (Chrome and Mozilla) and list out the forensic importance of it. | CO3 | E | 5 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Illustrate various forms of data hiding such as Disk cleaning utilities, File wiping utilities and Disk degaussing. | CO4 | An | 10 |
|  | b. | Explain in detail about Cryptography, types of Encryptions. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 5. | a. | Outline various password cracking methods. | CO5 | A | 10 |
|  | b. | Briefly discuss the various tools for acquiring media, discuss about various file formats of forensic image. Compare about various storage devices. | CO5 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Describe about four types of partitions. Write notes on Net stat, Net session and open files. | CO2 | R | 10 |
|  | b. | Write the steps to analyze a drive using sluthkit forensic tool, and what details you infer from it. | CO1 | E | 10 |
|  |  |  |  |  |  |
| 7. | a. | Correlate the various things which you observe by viewing packets using Wireshark. | CO4 | C | 8 |
|  | b. | Discuss and relate how hard disk can be destroyed safely. | CO3 | E | 12 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Briefly discuss about various types of Firewalls. | CO6 | R | 10 |
|  | b. | Illustrate the use of log files gathered from various digital devices. | CO6 | A | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | From original drive develop a way by which imaging can be done and tell the benefits of Hashing. | CO6 | C | 10 |
|  | b. | Write the steps for report preparation and presentation. | CO6 | E | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the technical aspects related to Digital Forensics. |
| CO2 | Explain Windows operating system and all of its functions. |
| CO3 | Devise network forensics, evidence collection and network forensics analysis. |
| CO4 | Apply the art of steganography. |
| CO5 | Choose and apply current computer forensics tools. |
| CO6 | Outline investigative process and codes of ethics. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 15 | 5 |  |  | 10 |  | 30 |
| CO2 | 25 | 5 |  |  |  |  | 30 |
| CO3 |  | 15 |  |  | 17 |  | 32 |
| CO4 |  |  | 10 | 10 |  | 8 | 28 |
| CO5 |  |  | 10 | 10 |  |  | 20 |
| CO6 | 10 |  | 10 |  | 10 | 10 | 40 |
|  | | | | | | | **180** |

Graphical user interface, application

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| **Course Code** | **20CA3011** | **Duration** | **3hrs** |
| **Course Name** | **BUSINESS CONTINUITY AND DISASTER RECOVERY MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the different phases of Business Continuity Planning. | CO1 | U | 10 |
|  | b. | Explain the BCMS process life cycle model (Alexander, 2009). | CO1 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe the Business continuity planning. | CO1 | U | 10 |
|  | b. | Explain the types of Disaster to consider in BCP/DR. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Discuss the importance of Risk management. | CO2 | U | 10 |
|  | b. | Explain the risk management methodology. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss the Incidence Response plan in detail. | CO3 | U | 10 |
|  | b. | Explain the different phases of Business continuity strategy development with neat diagram. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | State the necessity of Crisis communication plan and Explain. | CO3 | R | 10 |
|  | b. | Explain the Disaster Recovery Site assessment. | CO6 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Describe about Nmap tool. | CO4 | U | 10 |
|  | b. | Discuss Emergency response plan. | CO5 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain BIA. | CO6 | U | 10 |
|  | b. | List out the creativity supporting techniques used in BCS and explain. | CO5 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain BCP Testing. | CO4 | U | 10 |
|  | b. | Summarize the followings   1. COBIT 2. OCTAVE | CO5 | U | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain Quantitative and Qualitative Risk assessment methods with examples. | CO6 | U | 10 |
|  | b. | Explain the FISHBONE Diagram with example. | CO2 | A | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Design a disaster recovery plan, business continuity plan for sustained organizational operations. |
| CO2 | Identify and prioritize critical business functions; determine maximum tolerable downtime and other criteria and describe concepts of risk management. |
| CO3 | Describe Business Continuity Strategy and be able to discuss incident response options and contingency planning components. |
| CO4 | Explain backup storage strategy, recovery site strategies and provide Training to test, update, assess and maintain the plan. |
| CO5 | Illustrate incident response, detection; response; reporting; recovery; remediation and understand fault tolerance requirements. |
| CO6 | Discuss the Best practices for Business continuity and disaster recovery planning. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 40 | - | - | - | - | 40 |
| CO2 | - | 20 | 10 | - | - | - | 30 |
| CO3 | 10 | 20 | - | - | - | - | 30 |
| CO4 | - | 20 | - | - | - | - | 20 |
| CO5 | 10 | 20 | - | - | - | - | 30 |
| CO6 | - | 30 | - | - | - | - | 30 |
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| **Course Code** | **20CA3012** | **Duration** | **3hrs** |
| **Course Name** | **DATABASE SECURITY MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | | |
| 1. | a. | Observe the problem given below and answer the questions:  Consider the following set of requirements for a UNIVERSITY database that is used to keep track of students’ transcripts.   1. The university keeps track of each student’s name, student ID number, permanent addressand phone number, birth date, sex, class (Year 1/Year2/etc),major department, and the degree program (B.A., B.Sc., ..., Ph.D.). 2. Each department is described by a name, department code, office number, office phone number, and college. Both name and code have unique values for each department. 3. Each course has a course name, description, course code, number of credit hours, and offering department. The value of the course number is unique for each course.   Design an **ER diagram** for theschema and draw it. Specify the **key attributes** of each **entity type**, draw the **multivalued/ composite attributes** with respective symbols and identify the structural constraintson each **relationship type**. | | CO1 | A | 10 |
|  | b. | Explain data modeling and its objectives. Explain the application development life cycle. | | CO1 | R | 10 |
|  |  | **(OR)** | |  |  |  |
| 2. | a. | Explain normalization procedures in detail. | | CO1 | R | 10 |
|  | b. | Apply first three normal forms for the following table and list down the decomposed tables with respective sample data sets:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **S\_id** | **Sales**  **date** | **Customer**  **name** | **Item**  **id** | **Item**  **name** | **Unit**  **price** | **Quantity** | **Total**  **amount** | | 1 | 12-Nov-2022 | Sarah | 1001 | Rin Soap | 11 | 2 | 22 | |  |  |  | 1015 | Candle | 20 | 3 | 60 | | 2 | 12-Nov-2022 | Robel | 1015 | Candle | 20 | 1 | 20 | | 3 | 13-Nov-2022 | Sarah | 1120 | Rice | 16 | 3 | 48 | | | CO1 | A | 10 |
|  |  |  | |  |  |  |
| 3. | a. | Explain private information retrieval in detail with suitable examples. | | CO2 | U | 10 |
|  | b. | Explain in detail about FHE Based Private Information Retrieval. | | CO2 | R | 10 |
|  |  | **(OR)** | |  |  |  |
| 4. | a. | Explain the need of data warehouses. | | CO2 | U | 10 |
|  | b. | Explain in detail about private data warehouse queries with suitable examples. | | CO2 | R | 10 |
|  |  |  | |  |  |  |
| 5. | a. | Explain data leakage in detail with security breach evidence. | | CO3 | A | 10 |
|  | b. | Write notes on the following: privacy, data anonymization and secure data publishing. | | CO3 | R | 10 |
|  |  | **(OR)** | |  |  |  |
| 6. | a. | How will you grant and revoke authority to users in a University database like Eduserve? Explain in detail. | | CO4 | An | 10 |
|  | b. | Explain the role of encryption in databases. | | CO4 | R | 10 |
|  |  |  | |  |  |  |
| 7. | a. | Explain in detail on backup and recovery concepts of databases. | | CO5 | R | 10 |
|  | b. | How would you prevent disaster in the customer database storage of a web application like Airtel provider website? Explain. | | CO5 | An | 10 |
|  |  | **(OR)** | |  |  |  |
| 8. | a. | Write notes on database auditing models in detail. | | CO6 | R | 10 |
|  | b. | Describe application data auditing with a suitable example. | | CO6 | U | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | |
| 9. | a. | Demonstrate on SQL injection with suitable examples. | | O4 | A | 10 |
|  | b. | Discuss on the need of planning on backup of database transactions. | | CO5 | U | 10 |

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|  | **COURSE OUTCOMES** | | | | | | | |
| CO1 | Describe database concepts. | | | | | | | |
| CO2 | Explain operational threats and vulnerable points of accessing and assess them. | | | | | | | |
| CO3 | Propose plan to prevent data leakage and data breach. | | | | | | | |
| CO4 | Protect personally identifiable information and other sensitive data from hackers. | | | | | | | |
| CO5 | Devise the schedule for database backup. | | | | | | | |
| CO6 | Develop security policy and perform database auditing. | | | | | | | |
| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | | |
| CO / P | | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | | 20 |  | 20 |  |  |  | 40 |
| CO2 | | 20 | 20 |  |  |  |  | 40 |
| CO3 | | 10 |  | 10 |  |  |  | 20 |
| CO4 | | 10 |  | 10 | 10 |  |  | 30 |
| CO5 | | 10 | 10 |  | 10 |  |  | 30 |
| CO6 | | 10 | 10 |  |  |  |  | 20 |
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| **Course Code** | **20CA3017** | **Duration :** | **3hrs** |
| **Course Name** | **ECONOMIC OFFENCES** | **Max. Marks :** | **100** |

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome / Pattern** | **Marks** |
|  |  | **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** |  |  |
| 1. | a. | Summarize the economic offences under various categories and explain any one economic offence and its impact on society. | CO1 / U | 10 |
|  | b. | Analyze any two case studies related to transnational economic offences. | CO2 / An | 10 |
| **(OR)** | | | | |
| 2. | a. | Categorize the types of food adulteration and summarize their harmful effects on society. | CO1 / A | 10 |
|  | b. | Explain the different forms of trafficking. | CO2 / U | 10 |
|  |  |  |  |  |
| 3. | a. | Outline the frauds related to land grabbing and the real estate business. | CO3 / U | 10 |
|  | b. | Analyze the different types of banking frauds. | CO3 / An | 10 |
| **(OR)** | | | | |
| 4. | a. | Survey the different ways in which money is laundered and why it is a serious economic offence. | CO3 / An | 10 |
|  | b. | Analyze a case study related to banking frauds. | CO3/An | 10 |
|  |  |  |  |  |
| 5. | a. | Identify the offences involved in the theft of cultural objects and idols. | CO3 / A | 10 |
|  | b. | Discuss the harmful effects of house tenancy and insurance frauds. | CO4 / U | 10 |
| **(OR)** | | | | |
| 6. | a. | Outline the significance of intellectual property rights to an individual and explain the various types of IPR. | CO3 / U | 10 |
|  | b. | Discuss the ways in which different types of false travel documents  are used in an offensive way. | CO4 / A | 10 |
|  |  |  |  |  |
| 7. | a. | Summarize the application of digital technology in economy and business. | CO4 / U | 10 |
|  | b. | Examine the laws related to the prevention of corruption. | CO5 /An | 10 |
| **(OR)** | | | | |
| 8. | a. | As a cyber-security professional and cyber forensic expert discuss the ways in which you can detect and prevent of economic offences. | CO4 / A | 10 |
|  | b. | Justify that digital technology has been abused in various ways for committing economic offences. | CO5 / E | 10 |
|  | | **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** |  |  |
| 9. |  | Model a technical solution to economic offences by explaining how it can solve the problems related to the offence using at least three case studies. | CO6 / A | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain the concepts of economic offences. |
| CO2 | Outline the types and forms of economic offences. |
| CO3 | State the modus operandi of committing economic offences. |
| CO4 | Describe the economic offences in the digital space. |
| CO5 | Outline the laws relating to economic offences in India. |
| CO6 | Apply best practices to prevent and detect economic offences and discuss the role of an information security professional. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 10 | 10 |  |  |  | 20 |
| CO2 |  | 10 |  | 10 |  |  | 20 |
| CO3 |  | 20 | 10 | 30 |  |  | 60 |
| CO4 |  | 20 | 20 |  |  |  | 40 |
| CO5 |  |  |  | 10 | 10 |  | 20 |
| CO6 |  |  | 20 |  |  |  | 20 |
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| **Course Code** | **20CA3018** | **Duration** | **3hrs** |
| **Course Name** | **ETHICAL HACKING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the following terms with respect to Ethical Hacking  i) Hack Value ii) Exploit iii) Vulnerability  iv) Target Evaluation v) Zero day attack vi) Daisy Chaining | CO1 | R | 15 |
|  | b. | Classify the categories of information security threat. | CO1 | U | 5 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain information security attack vectors, threat categories and types of attacks on a system. | CO2 | U | 15 |
|  | b. | What is information warfare? What are its type? | CO2 | R | 5 |
|  |  |  |  |  |  |
| 3. | a. | Relate various types of scanning done using Nmap. List different services with their port numbersto enumerate. | CO3 | A | 15 |
|  | b. | What is banner grabbing? What are its types? What are the uses of banner grabbing? | CO3 | R | 5 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Categorize the process of gathering information from a network by snooping on transmitted data. (Ex. Eavesdropping and Drive by Download Payloads.) | CO4 | An | 15 |
|  | b. | Illustrate in day to day activities how various Operating Systems are compromised by various password attacks. | CO4 | An | 5 |
|  |  |  |  |  |  |
| 5. | a. | Defend the need of authentication, and correlate the three types of authentication.Compare WEP, WPA and WPA2. | CO5 | E | 12 |
|  | b. | Define host header injection vulnerability. Explain the ways by which header injection vulnerability can be prevented. | CO5 | R | 8 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Attackers often use social engineering methods to pin point your location while you are from a mobile device- Defend how this is accomplished. | CO1 | A | 10 |
|  | b. | Write about Operating system hardening and various ways by which windows OS can be protected. | CO2 | C | 10 |
|  |  |  |  |  |  |
| 7. | a. | Classify User Authentication. Summarize various types’of password attacks. | CO3 | A | 10 |
|  | b. | Explain in detail about Wi-Fi security protocols that secure wireless connections and describe about A) Evil Twin attack, B) Jamming Signals, C) Misconfiguration Attacks, D) Honey spot Attack. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Develop the ways of Evading IDS, Firewalls, and Honeypots. | CO6 | C | 20 |
| **PART – B (1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | What is Honeypot? How does it work? What are different types of Honeypots? | CO6 | R | 8 |
|  | b. | What is Report Writing? Write an essay on report writing stages | CO6 | E | 12 |

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|  | **COURSE OUTCOMES** |
| CO1 | Determine the security threats and vulnerabilities in computer networks using ethical hacking techniques. |
| CO2 | Identify various attacks in various domains of cyber space. |
| CO3 | Use the tools that can be used to perform information gathering. |
| CO4 | Explain the exploits in various operating systems and Wireless environment. |
| CO5 | Identify the vulnerabilities associated with various network applications and database system |
| CO6 | Comprehend report writing procedure. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 15 | 5 | 10 |  |  |  | 30 |
| CO2 | 5 | 15 |  |  |  | 10 | 30 |
| CO3 | 5 |  | 25 |  |  |  | 30 |
| CO4 |  | 10 |  | 20 |  |  | 30 |
| CO5 | 8 |  |  |  | 12 |  | 20 |
| CO6 | 8 |  |  |  | 12 | 20 | 40 |
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| **Course Code** | **20CA3020** | **Duration** | **3hrs** |
| **Course Name** | **PYTHON FOR CYBER SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Summarize the usage of numpy and explain the array operations with example. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Describe the usage of pandas library and illustrate how missing values are handled. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. | a. | Summarize how data is represented and the steps involved in creating feature and target matrix. | CO2 | U | 10 |
|  | b. | Explain the usage of data visualization library and construct a program to create various charts. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Explain the types of cryptography and encrypt the word “Hello” with key =7. Encrypt and decrypt the message using multiplicative cipher. | CO4 | A | 20 |
|  |  |  |  |  |  |
| 5. | a. | Construct a program to generate hash value for the given input string. | CO4 | A | 8 |
|  | b. | Describe the different modes of operation. | CO4 | U | 12 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Construct a program to communicate between the client and the server using socket programming. | CO4 | A | 10 |
|  | b. | Explain about penetration testing and the types of approaches used in penetration testing. | CO5 | A | 10 |
|  |  |  |  |  |  |
| 7. |  | Explain about web application penetration testing and the tools used to perform the same. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain HTTP protocol and the anatomy of HTTP Request. | CO5 | U | 10 |
|  | b. | Construct a program to extract the content of the web page. | CO5 | A | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Construct a program to retrieve wifi passwords connected to a network and discuss about password crafting. | CO6 | A | 10 |
|  | b. | Explain cross site scripting, hashing and retrieving windows password. | CO3 | A | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Use Python in data analysis using NumPy, IPython and Pandas. |
| CO2 | Gain knowledge on Python’s role in data preparation, data visualization and statistical computations. |
| CO3 | Explain the Web Application Security, which includes Cross-Site Scripting Attacks, Cross-Site Request Forgery, SQL Injection Attacks. |
| CO4 | Describe crypto primitives and their applications. |
| CO5 | Outline the process behind web pentesting. |
| CO6 | Discuss the role ethical hacking plays in providing secure and robust networks. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 40 | - | - | - | - | 40 |
| CO2 | - | 10 | 10 | - | - | - | 20 |
| CO3 | - | 20 | 10 | - | - | - | 30 |
| CO4 | - | 12 | 38 | - | - | - | 50 |
| CO5 | - | 10 | 20 | - | - | - | 30 |
| CO6 | - | - | 10 | - | - | - | 10 |
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| **Course Code** | **20CA3022** | **Duration** | **3hrs** |
| **Course Name** | **SECURITY IN THE CLOUD** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Categorize the system model designs for distributed and cloud computing. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Illustrate the role of major actors of cloud computing with the help of real-time scenarios. | CO1 | A | 10 |
|  | b. | Classify the service models of cloud computing. | CO1 | An | 10 |
|  |  |  |  |  |  |
| 3. |  | Categorize the levels of virtualization implementation. | CO2 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the strategies used for resource management in clusters. | CO2 | U | 10 |
|  | b. | Classify the virtualization architecture based on the position of the virtualization layer and discuss the features of each class. | CO2 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the layered cloud architecture design and highlight its salient features. | CO3 | U | 10 |
|  | b. | Identify the components of Hadoop and explain its application in parallel and distributed programming. | CO3 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Discuss the challenges faced in designing cloud architecture. | CO3 | U | 10 |
|  | b. | Examine the suitability of HDFS and Map reduce model for solving problems related to big data processing. | CO3 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Amazon wants to calculate its total sales city-wise for the year 2021. The database contains the details of daily sales of each city. Apply map reduce model to simplify the computation of city-wise total sales. | CO4 | A | 10 |
|  | b. | Identify any three top security risks associated with cloud computing and analyze the risk mitigation strategies. | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Classify the application architectures for mapping applications to parallel and distributed systems. | CO4 | An | 10 |
|  | b. | Explain autonomic computing and its features. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Analyze the issues in symmetric key cryptography and discuss how PKI is used to resolve them. | CO6 | An | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Compare deployment models versus service models of cloud computing. |
| CO2 | Apply suitable virtualization concept. |
| CO3 | Design and Compute the Storage Clouds. |
| CO4 | Use Programming model. |
| CO5 | Debate the security risks associated with the cloud. |
| CO6 | Discuss the governance and the legal issues in the cloud. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  |  | 10 | 30 |  |  | 40 |
| CO2 |  | 10 |  | 30 |  |  | 40 |
| CO3 |  | 20 | 20 |  |  |  | 40 |
| CO4 |  |  | 10 | 10 |  |  | 20 |
| CO5 |  | 10 | 10 |  |  |  | 20 |
| CO6 |  |  |  | 20 |  |  | 20 |
|  |  | 40 | 50 | 90 |  |  | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **20CA3024** | **Duration** | **3hrs** |
| **Course Name** | **SOCIAL MEDIA CRIMES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Describe the different types of social media through suitable examples. | CO1 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Summarize the differences between Web 1.0, Web 2.0 and Web 3.0. | CO1 | U | 10 |
|  | b. | Briefly discuss the issues in digital privacy through suitable example. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. |  | Write short notes on the following:   1. Social networking sites. 2. Social review sites. 3. Image sharing sites. 4. Video hosting sites. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Briefly discuss any four social networking sites by highlighting their application and history. | CO2 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Identify the common usage of social media through suitable examples. | CO3 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Social media serves as an advertisement platform in today’s environment. Justify this statement through valid examples. | CO3 | A | 10 |
|  | b. | Analyze the use of social networking sites for small-scale business. | CO3 | An | 10 |
|  |  |  |  |  |  |
| 7. |  | Describe the types of social media crimes against women and children. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Analyze the causes, consequences and countermeasures of Child pornography. | CO4 | An | 10 |
|  | b. | Elaborate the online frauds that are targeted against Children, Youngsters, Women and Senior citizen. | CO5 | U | 10 |
| **PART – B(1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Discuss the various methods by which online frauds are carried out in real world. | CO5 | U | 10 |
|  | b. | Illustrate the concept of moral policing and highlight how it is different from online policing. | CO6 | A | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Explain about media, social media and social networks. |
| CO2 | Describe different types of social media and their vulnerabilities. |
| CO3 | Analyze the various services of social media, usage and their promotions. |
| CO4 | Discuss social media and crimes against Women and Children. |
| CO5 | Tell the other forms of social media such as online frauds, financial frauds, Digital cloning frauds, identity theft data privacy and legal measures to prevent social media crimes. |
| CO6 | Outline the response of the Criminal Justice System towards the social networking sites. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 20 | 20 | - | - | - | - | 40 |
| CO2 | - | 40 | - | - | - | - | 40 |
| CO3 | 20 | - | 10 | 10 | - | - | 40 |
| CO4 | - | 20 | - | 10 | - | - | 30 |
| CO5 | - | 20 | - | - | - | - | 20 |
| CO6 | - | - | 10 | - | - | - | 10 |
|  | | | | | | | **180** |

Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **20CA3025** | **Duration** | **3hrs** |
| **Course Name** | **DIGITAL SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Write in detail the privacy impacts of emerging technologies. | CO1 | A | 10 |
|  | b. | Discuss on the privacy compromises in the web applications. | CO1 | E | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | E-commerce is existent ever since internet is renderedfor public usage. However recently, e-commerce threats are rising drastically. Explain the security threats in e-commerce using some real cases / evidence. | CO2 | A | 10 |
|  | b. | Explain why cloud security is considered important when it comes for its implementation in e-commerce applications. | CO2 | A | 10 |
| 3. | a. | Explain cryptographic access control in detail. | CO2 | U | 10 |
|  | b. | Explain the role of cybersecurity in healthcare. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Discuss on encryption blind spots with suitable examples. | CO3 | U | 10 |
|  | b. | Identify and explain FIVE best data protection practices for healthcare community. | CO3 | A | 10 |
| 5. | a. | Describe on the significance of e-learning systems in the current era with suitable examples. | CO4 | A | 10 |
|  | b. | Distinguish how today’s e-learning platform has less security features when compared to financial applications (e.g. bank app). | CO4 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain how security management model can be implemented in e-learning systems. | CO4 | A | 10 |
|  | b. | Explain the concept of cryptocurrency in detail. | CO5 | R | 10 |
| 7. | a. | Explain Bitcoin's Blockchain Technology in detail. | CO5 | R | 10 |
|  | b. | Explain blockchain types and how they differ from databases. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the major characteristics of a smart city. | CO6 | R | 10 |
|  | b. | In a recent article (Oct 19th, 2022) in economic times, the following news is published. Read through the paragraph and answer the questions below. Smart cities, energy shift make India a crucial market, says Siemens' Matthias Rebellius **Siemens** AG is well-positioned to play a key role in India's rapid urbanization and **energy** transformation, said Matthias Rebellius, **CEO**, smart infrastructure, at the Munich-headquartered conglomerate. In an interview to Kalpana Pathak, he said the MNC will continue **India**investment, having spent ₹1 billion here in the past five to six years on manufacturing facilities and expansion.   1. Describe the need of implementing smart cities in India (3 marks). 2. Identify the security issues currently concerned with the smart cities in India (4 marks). 3. List down your recommendations for upgrading the current systems in the smart cities in India with appropriate justification (3 marks). | CO6 | An | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain any five technology trends in reducing healthcare costs. | CO3 | A | 10 |
|  | b. | Explain any one blockchain application in detail. | CO5 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Recommend suitable controls and procedures for ensuring privacy and security. |
| CO2 | Explain current e-commerce security threats faced by the organization and how to combat the threats. |
| CO3 | Apply best practices and solutions required to manage the security of the healthcare data. |
| CO4 | Demonstrate the ability to select and design security solutions to the E-Learning module. |
| CO5 | Generate knowledge about various operations associated with the life cycle of Blockchain and Crypto currency. |
| CO6 | Outline key issues with the development of smart cities. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  |  | 10 |  | 10 |  | 20 |
| CO2 |  | 10 | 20 |  |  |  | 30 |
| CO3 |  | 20 | 20 |  |  |  | 40 |
| CO4 |  |  | 20 | 10 |  |  | 30 |
| CO5 | 20 | 20 |  |  |  |  | 40 |
| CO6 | 10 |  |  | 10 |  |  | 20 |
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Description automatically generated with medium confidence

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| **Course Code** | **21CA2006** | **Duration** | **3hrs** |
| **Course Name** | **COMPUTER ORGANIZATION AND ARCHITECTURE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | | |
| 1. | | a. | Illustrate the truth table of AND, OR, NOT and XOR gate. | CO1 | U | 10 |
|  | | b. | Enumerate on the working of half adder and full adder. | CO1 | R | 10 |
|  | |  | **(OR)** |  |  |  |
| 2. | | a. | Explain in detail the evolution of automated computing devices. | CO1 | U | 10 |
|  | | b. | Summarize on NPN transistor. | CO2 | U | 10 |
|  | |  |  |  |  |  |
| 3. | | a. | Enumerate on different types of addressing modes. | CO2 | R | 12 |
|  | | b. | Explain in detail the components of a simple processor. | CO2 | U | 8 |
|  | |  | **(OR)** |  |  |  |
| 4. | | a. | Enumerate on any five instruction set categories. | CO3 | R | 10 |
|  | | b. | Demonstrate the working of MOSFET. | CO3 | U | 10 |
|  | |  |  |  |  |  |
| 5. | | a. | Describe process scheduling algorithms. | CO3 | R | 10 |
|  | | b. | Enumerate on the steps involved in boot process. | CO4 | R | 10 |
|  | |  | **(OR)** |  |  |  |
| 6. | | a. | Explain in detail multiprocessor and the benefits of multiprocessing. | CO4 | U | 10 |
|  | | b. | Illustrate on instruction pipelining. | CO4 | U | 10 |
|  | |  |  |  |  |  |
| 7. | | a. | Explain Von-Neumann and Harvard architecture. | CO5 | R | 10 |
|  | | b. | Illustrate on paged memory management. | CO5 | U | 10 |
|  | |  | **(OR)** |  |  |  |
| 8. | | a. | Explain in detail the smartphone architecture. | CO5 | U | 10 |
|  | | b. | Summarize on cloud computing. | CO6 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | | |
| 9. | | a. | Enumerate on the future directions in computer architecture. | CO6 | R | 10 |
|  | | b. | Explain in detail the disruptive technologies of computer architecture. | CO6 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the architecture of a computer and the digital logic circuits. |
| CO2 | Identify the processor elements and the components of a computer system. |
| CO3 | Make use of various hardware and software interfaces. |
| CO4 | Elaborate the processor and memory architectures. |
| CO5 | Illustrate the application of computer architecture. |
| CO6 | Outline the future direction of computer architecture. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 10 | 20 |  |  |  |  | 30 |
| CO2 | 12 | 18 |  |  |  |  | 30 |
| CO3 | 20 | 10 |  |  |  |  | 30 |
| CO4 | 10 | 20 |  |  |  |  | 30 |
| CO5 | 10 | 20 |  |  |  |  | 30 |
| CO6 | 10 | 20 |  |  |  |  | 30 |
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Graphical user interface, application

Description automatically generated with medium confidence

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| **Course Code** | **21CA2007** | **Duration** | **3hrs** |
| **Course Name** | **JAVA PROGRAMMING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the iteration statements in java with example. | CO1 | U | 10 |
|  | b. | Describe Inheritance and its type with suitable example. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the array and its types with suitable example. | CO1 | U | 10 |
|  | b. | i. Explain the use of exception handling in java.  ii. Write a JAVA program to generate and handle division by zero arithmetic exception. | CO3 | A | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain Java built in exception. | CO3 | U | 10 |
|  | b. | Describe Multithreading with an example. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain Stringbuffer class and its functions with suitable example. | CO5 | U | 10 |
|  | b. | Differentiate Method overloading and Method overriding. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the constructors in detail with example program. | CO2 | U | 10 |
|  | b. | i. Discuss various Access protections available in JAVA.  ii. Discuss the access modifier that affects the visibility of a member in different access locations. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain Suspending, Resuming and stopping threads with example. | CO4 | U | 10 |
|  | b. | Describe the packages in java with example. | CO5 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the Different types of layout management. | CO6 | U | 10 |
|  | b. | Describe the Event Listener interfaces in java. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain Java Event Handling Code. | CO6 | U | 10 |
|  | b. | 1. Write a Java program to reverse the given number. 2. Write a java program to find the Fibonacci series. | CO1 | A | 10 |
| **PART – B (1 X 20= 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Write a JAVA program to create a super class called figure that stores the dimensions of a two- dimensional object. It also defines a method called area () that computes the area of an object. The program derives two sub classes from figure. The first is rectangle and the second is Triangle. Each of these subclasses overrides area (), so that it returns the area of a rectangle and a triangle respectively. | CO2 | A | 10 |
|  | b. | 1. Write a java AWT program to develop registration form. 2. Write a program to create circle class with area function to find area of circle. | CO6 | A | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Create java programs that solve simple business problems. |
| CO2 | Summarize the basic principles of object-oriented programming including constructors, inheritance, polymorphism. |
| CO3 | Construct programs in exception handling. |
| CO4 | Summarize multithreading concepts. |
| CO5 | Apply i/o methods in applications. |
| CO6 | Develop simple graphical user interfaces. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | - | 20 | 10 | - | - | - | 30 |
| CO2 | - | 30 | 10 | - | - | - | 40 |
| CO3 | - | 10 | 10 | - | - | - | 20 |
| CO4 | - | 30 | - | - | - | - | 30 |
| CO5 | - | 30 | - | - | - | - | 30 |
| CO6 | - | 20 | 10 | - | - | - | 30 |
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| **Course Code** | **21CA3008** | **Duration** | **3hrs** |
| **Course Name** | **ARTIFICIAL INTELLIGENCE TECHNIQUES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Discuss about the various applications of Artificial Intelligence. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Paraphrase the various functionalities of python in artificial Intelligence. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. |  | Explain in detail about the preprocessing. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Describe the different type of classification techniques in detail. | CO2 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Demonstrate the ensemble learning. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Examine about the logic programming. | CO4 | E | 20 |
|  |  |  |  |  |  |
| 7. |  | Explain in detail about the heuristic search techniques. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Summarize the probabilistic reasoning. | CO5 | U | 20 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. |  | Design a speech recognizer. | CO6 | C | 20 |

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the foundations of artificial intelligence. |
| CO2 | Analyze machine learning algorithms. |
| CO3 | Make use of predictive analytics and ensemble learning. |
| CO4 | Make use of intelligence for solving problems. |
| CO5 | Outline the concepts of logic programming and heuristic searching. |
| CO6 | Illustrate the concepts of speech recognizer. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 |  | 40 |  |  |  |  | 40 |
| CO2 |  | 40 |  |  |  |  | 40 |
| CO3 |  |  | 20 |  |  |  | 20 |
| CO4 |  |  |  |  | 20 |  | 20 |
| CO5 |  | 40 |  |  |  |  | 40 |
| CO6 |  |  |  |  |  | 20 | 20 |
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| **Course Code** | **21CA3011** | **Duration** | **3hrs** |
| **Course Name** | **HUMAN COMPUTER INTERACTION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **Course Outcome** | **Bloom’s Level** | **Marks** |
| **PART – A(4 X 20= 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Recall the technologies used in display devices. | CO1 | R | 10 |
|  | b. | Tabulate the categories of thinking and memory types. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Visualize the type of devices used for virtual reality and 3D interaction. | CO1 | R | 20 |
|  |  |  |  |  |  |
| 3. | a. | Describe the Norman’s model of interaction. | CO2 | R | 10 |
|  | b. | Recall the paradigms for interaction. | CO2 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Choose any two of the interface styles and use the interaction framework to analyze the interactions involved for a database selection task. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 5. | a. | Trace the interaction design process in human computer interaction. | CO3 | U | 10 |
|  | b. | Describe the techniques used for producing rapid prototypes. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Illustrate QOC design rationale using an example. | CO3 | R | 12 |
|  | b. | Relate the relationship between software development life cycle and human computer interaction with suitable sketch. | CO3 | A | 8 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate the factors and challenges that raises in designing for diversity. | CO4 | A | 10 |
|  | b. | Sketch the diagrammatic notations used in dialog design. | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Compare static and dynamic web content. | CO6 | U | 10 |
|  | b. | Explain the types of communication. | CO5 | U | 10 |
| **PART – B (1 X 20 = 20 MARKS)**  **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Describe the elements of windowing systems. | CO6 | R | 10 |
|  | b. | Explain about virtual and augmented reality | CO6 | U | 10 |

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the fundamental of HCI. |
| CO2 | Illustrate the concepts of interactions. |
| CO3 | Explain design process. |
| CO4 | Apply design principles. |
| CO5 | Demonstrate the design models. |
| CO6 | Illustrate communication interface. |

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| **Assessment Pattern as per Bloom’s Taxonomy** | | | | | | | |
| CO / P | **Remember** | **Understand** | **Apply** | **Analyze** | **Evaluate** | **Create** | **Total** |
| CO1 | 40 | - | - | - | - | - | 40 |
| CO2 | 20 | - | 20 | - | - | - | 40 |
| CO3 | 22 | 10 | 8 | - | - | - | 40 |
| CO4 | - | - | 10 | - | - | - | 10 |
| CO5 | - | 10 | 10 | - | - | - | 20 |
| CO6 | 10 | 20 | - | - | - | - | 30 |
|  | | | | | | | **180** |