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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **22CA2004** | **Duration** | **3hrs** |
| **Course Title** | **MOBILE APPLICATION DEVELOPMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Explain the different data structures used in Dart and how they work with examples. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Write code examples in Dart to explain four OOP concepts and their usage. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 3. | a. | Develop a Flutter UI that responds to multiple gesture events and explain the outcomes with examples. | CO3 | A | 10 |
|  | b. | State the characteristics of Flutter, React Native, and Xamarin and how they differ. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain how to use different Flutter gestures to enhance app interactivity with suitable examples. | CO4 | A | 10 |
|  | b. | Describe Navigation and Routing in Flutter with a suitable example. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 5. |  | Develop a suitable program for creating and manipulating the database containing the product details such as product id, product name, product price, product image by using the SQLite database. | CO5 | C | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Define a widget in Flutter and categorize different types of widgets with examples. | CO4 | R | 10 |
|  | b. | Compare Flutter, React Native, and Xamarin based on key factors such as performance, UI capabilities, and platform support. | CO3 | An | 10 |
|  |  |  |  |  |  |
| 7. |  | Define a constructor in Dart and describe its various forms with examples. | CO2 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Explain the structure of a typical database record for a library book and develop a program to create, store, update, delete, and retrieve book details such as Book ID, Title, Author, and Availability using a database. | CO6 | U | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Develop a program to create and manipulate database records containing employee details, such as Employee ID, Employee Name, and Salary, using Firebase. | CO6 | C | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the basics on dart. |
| CO2 | Explore the object-oriented concepts in dart. |
| CO3 | Design a user interface using Flutter. |
| CO4 | Build themes and animation in Flutter. |
| CO5 | Create firebase plugins. |
| CO6 | Create apps with sqlite database. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **22CA2010** | **Duration** | **3hrs** |
| **Course Title** | **EMERGING TECHNOLOGIES IN COMPUTING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Apply IoT logical design principles to develop an IoT system. | CO1 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Analyze the security risks and privacy concerns associated with Bitcoin transactions. | CO2 | An | 20 |
|  |  |  |  |  |  |
| 3. |  | Evaluate the classifications of robots based on their functionality. | CO3 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Explain qubits in detail, including their properties, comparison with classical bits, and applications in quantum computing. | CO4 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Apply different e-commerce business models by using their key characteristics and use cases. | CO5 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Assess the benefits and challenges of implementing domain-specific IoT solutions. | CO1 | E | 20 |
|  |  |  |  |  |  |
| 7. |  | List the characteristics of a robot and explain each in detail. | CO3 | R | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Analyze the common security risks in e-commerce transactions and suggest ways to mitigate them. | CO6 | An | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Organize electronic payment systems by technology and application. | CO6 | An | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Identify the key components of IoT and the possible future IoT trends. |
| CO2 | Summarize cryptography, crypto currencies and their framework. |
| CO3 | Recognize the concepts of robotics and the component characteristics. |
| CO4 | Apply the knowledge on quantum computing concepts and algorithms. |
| CO5 | Summarize the fundamentals of e-commerce, EDI, digital payment methods, mobile commerce and safe e-commerce transactions. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **22CA2014** | **Duration** | **3hrs** |
| **Course Title** | **ARTIFICIAL INTELLIGENCE FOR SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Classify the different types of Machine Learning and explain their working principles with appropriate real-world examples. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Explain the key concepts of linear regression that make it suitable for predictive analysis. Using the data in the table below, apply linear regression to predict the number of security breaches that could occur when 180 phishing emails are received.   |  |  | | --- | --- | | **Number of Phishing Mails Received** | **Number of Security Breaches** | | 50 | 5 | | 100 | 10 | | 150 | 15 | | 200 | 20 | | 250 | 25 | | CO1 | A | 20 |
|  |  |  |  |  |  |
| 3. |  | Illustrate the working of decision tree using the dataset given below:   | **Traffic Type** | **Protocol** | **Packet Size** | **Encrypted** | **Malicious?** | | --- | --- | --- | --- | --- | | HTTP | TCP | Large | No | Yes | | HTTPS | TCP | Large | Yes | No | | FTP | TCP | Medium | No | Yes | | SSH | TCP | Small | Yes | No | | DNS | UDP | Small | No | No | | SMTP | TCP | Large | Yes | Yes | | Telnet | TCP | Medium | No | Yes | | RDP | TCP | Large | Yes | No | | CO2 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Illustrate the working of perceptron in the context of detection of spam using a suitable example. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 5. |  | Analyze the role of Recurrent Neural Networks (RNNs) in time-dependent applications and compare the functionalities of its key variants, highlighting their suitability for different real-world use cases. | CO3 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Explain the different types of malware attacks and their examples and analyze their impact on system security. | CO5 | U | 20 |
|  |  |  |  |  |  |
| 7. |  | Explain any four common network attacks and the techniques used for launching them. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Categorize the types of botnet topologies and explain their detection techniques using appropriate case studies. | CO5 | An | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Analyze the role of predictive analytics models for credit card fraud detection using appropriate case studies. | CO6 | An | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Outline the fundamental concepts of artificial intelligence. |
| CO2 | Demonstrate the different approaches of automated learning in the field of cyber security. |
| CO3 | Describe the current level of interconnection between different devices. |
| CO4 | Outline the important role in terms of the protection of sensitive user related information. |
| CO5 | Identify and detect the malware and cyber security threats. |
| CO6 | Identify fraud prevention with cloud. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **22CA2015** | **Duration** | **3Hrs** |
| **Course Title** | **MOBILE HACKING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Justify the importance of interoperability in the mobile ecosystem and its impact on security. | CO1 | E | 10 |
|  | b. | Analyze the role of control channels in cellular networks and their vulnerability to attacks. | CO2 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Analyze the potential risks associated with voice mailboxes in mobile networks. | CO1 | An | 10 |
|  | b. | Evaluate the effectiveness of Short Message Service as a communication channel in terms of security. | CO2 | E | 10 |
|  |  |  |  |  |  |
| 3. | a. | Analyze the security implications of using Near Field Communication in Android devices. | CO3 | An | 10 |
|  | b. | Evaluate the risks associated with rooting an Android device and its impact on the security model. | CO3 | E | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Analyze the potential risks of information leakage in Android applications. | CO3 | An | 10 |
|  | b. | Explain the need for secure network traffic interception practices in Android development. | CO3 | A | 10 |
|  |  |  |  |  |  |
| 5. | a. | Analyze the impact of mobile web browser vulnerabilities on mobile security. | CO4 | An | 10 |
|  | b. | Explain the need for secure mobile payment systems in the current generation of mobile applications. | CO4 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Determine the importance of regular security updates for mobile operating systems. | CO4 | A | 10 |
|  | b. | Analyze the role of mobile device management frameworks in securing mobile devices. | CO4 | An | 10 |
|  |  |  |  |  |  |
| 7. | a. | Analyze the challenges of fuzzing broadcast receivers in Android applications. | CO5 | An | 10 |
|  | b. | Evaluate the effectiveness of fuzzing Chrome for Android in identifying browser vulnerabilities. | CO5 | E | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Write the importance of fuzzing network protocols in mobile applications. | CO5 | A | 10 |
|  | b. | Analyze the potential risks associated with decompiling and debugging mobile applications. | CO5 | An | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Analyze the role of mobile app threat modeling in secure mobile development. | CO6 | An | 10 |
|  | b. | Justify the importance of secure mobile development guidance in preventing common vulnerabilities. | CO6 | E | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Illustrate the basics of mobile ecosystem and security models. |
| CO2 | Summarize on the attack surfaces in mobile ecosystem. |
| CO3 | Apply several testing and exploitation methods on android and iOS. |
| CO4 | Associate several hacking techniques for mobile exploitation. |
| CO5 | Perform mobile hacking with the appropriate tools and methods. |
| CO6 | Develop secure mobile model and mobile applications. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **22CA2019** | **Duration** | **3hrs** |
| **Course Title** | **WEB DEVELOPMENT AND ANALYTICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Define web hosting and categorize its types with appropriate examples. | CO2 | R | 10 |
|  | b. | Develop your academic portfolio with Flask framework. | CO2 | C | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Determine the protocols involved in communication between a web browser and a web server. | CO3 | A | 10 |
|  | b. | Identify the essential components of an URL and explain the functions of each component. | CO3 | R | 10 |
|  |  |  |  |  |  |
| 3. | a. | Differentiate between Select, Radio Items, Checklists, and describe the appropriate scenarios for their use. | CO3 | An | 10 |
|  | b. | Describe how Bootstrap enhances web development with an example. | CO3 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Develop a web page that accepts and display the following details using Dash Bootstrap components.   1. Your Name 2. Your Register Number 3. Your Degree 4. Your ABC ID 5. Your E-mail ID | CO3 | R | 20 |
|  |  |  |  |  |  |
| 5. |  | Create menus using Bootstrap with relevant examples. | CO5 | C | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Illustrate the structure of Dash App in detail. | CO5 | A | 20 |
|  |  |  |  |  |  |
| 7. | a. | Examine the characteristics and advantages of IDE with examples. | CO4 | A | 10 |
|  | b. | Formulate the steps for integrating an algorithm into web application. | CO4 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Describe the concept of web hosting with suitable examples. | CO6 | A | 15 |
|  | b. | Illustrate the step-by-step procedure for importing an entire Python file. | CO4 | A | 5 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Design a Web page that display the following details: Your Name, Your Image, Biography (not exceeding 5 lines), your CGPA up to 5 semesters using 2D or 3D charts. | CO1 | C | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Build interactive 2d and 3d charts. |
| CO2 | Develop python framework using flask. |
| CO3 | Build real time web application. |
| CO4 | Integrate machine learning algorithm into a webapp. |
| CO5 | Implement dash bootstrap components. |
| CO6 | Develop a web app on the cloud. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA2005** | **Duration** | **3hrs** |
| **Course Title** | **ESSENTIALS OF PYTHON PROGRAMMING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the functionality of any ten string functions in Python using suitable examples. | CO1 | U | 10 |
|  | b. | Write a program to calculate the simple interest for a given principal amount, for ‘n’ years of duration and at a rate of interest ‘r’. The program should get the required details as input, calculate the simple interest and display the maturity amount the account holder will get at the end of the deposit period. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the different numeric data types and arithmetic operators in Python with examples. | CO1 | U | 10 |
|  | b. | Predict the output of the following:  pa=5000.00  dis = 20  bal = pa\*dis/100  print(‘Purchase Amount : Rs. ’,pa)  print(‘Amount to be paid : Rs. ’,bal) | CO1 | An | 10 |
|  |  |  |  |  |  |
| 3. | a. | Develop a program to calculate the discount and amount to be paid by the customer based on the following conditions:   1. Purchase amount upto Rs. 10000, 2% discount. 2. Above 10,000 and upto 25,000, 4% discount 3. Above 25,000, 5% discount. | CO2 | A | 10 |
|  | b. | Develop a program that accepts the mark of a student as input and calculate the grade as per the following conditions:   |  |  | | --- | --- | | **Range of Marks** | **Grade** | | 95-100 | O | | 85-94 | S | | 75-84 | A | | 60-74 | B | | 45-59 | P | | <45 | R | | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Define a function to calculate the factorial of a number using recursion and use it to evaluate nCr. | CO3 | A | 10 |
|  | b. | Develop a number-guessing game where the program randomly selects a number between 1 and 50, and the user must guess it. Provide feedback such as "High" or "Low" after each guess. The game continues until the user guesses correctly or decides to quit. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 5. |  | Design a calculator that functions arithmetic operations using functions. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Consider the following sets:  domestic\_animals = {'Dog', 'Cat', 'Cow', 'Sheep', 'Goat'}  wild\_animals = {'Tiger', 'Lion', 'Elephant', 'Goat', 'Wolf'}  Create the above sets using Python code, develop the code for doing the following tasks using set operations and methods and predict the output of the operations too.  How many domestic animals are there?  Find out whether ‘Wolf’ is in the list of domestic animals.  Add ‘Zebra’ and ‘Horse’ to the ‘wild animals’.  Which animals are both domestic and wild?  Which animals are only domestic?  Which animals are only wild?  List all animals from either category.  List all animals that belong to exactly one category. | CO4 | A | 20 |
|  |  |  |  |  |  |
| 7. | a. | Illustrate multiple inheritance with a programming example. | CO5 | A | 10 |
|  | b. | Illustrate method overriding with a programming example. | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Create a class named ***‘dog’*** with attributes ***name, breed, color, food.*** Write Python code to do the following operations:   1. Add \_\_init\_\_() method for the above class. 2. Create two objects for the class 3. Print the ***id*** of the objects. 4. Print the address of the objects. 5. Define \_\_str\_\_() for the class and print the description of the objects. | CO5 | A | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Develop a Python program to read a text file or cpp file and convert it into lowercase | CO6 | A | 10 |
|  | b. | Develop a GUI window with a button and display a message when the button is clicked. | CO6 | A | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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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 | develop GUI applications. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA2007** | **Duration** | **3Hrs** |
| **Course Title** | **COMPUTER NETWORKS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the role of the Physical Layer in the Open Systems Interconnection model and describe how it facilitates communication between devices. Provide examples of physical layer components. | CO1 | A | 10 |
|  | b. | Differentiate between simplex, half-duplex, and full-duplex communication modes with examples. | CO2 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Analyze the limitations of wireless communication in the Physical Layer and suggest improvements for better performance. | CO2 | An | 10 |
|  | b. | Compare the use of computer networks in education versus traditional classrooms. | CO1 | An | 10 |
|  |  |  |  |  |  |
| 3. | a. | Analyze the role of Medium Access Control protocols in managing shared communication channels. | CO3 | An | 10 |
|  | b. | Evaluate the advantages and disadvantages of the Sliding Window Protocol compared to the Stop-and-Wait Protocol in terms of efficiency and reliability. | CO3 | E | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Examine the importance of flow control mechanisms in the Data Link Layer with suitable examples. | CO3 | A | 10 |
|  | b. | Evaluate the trade-offs between connection-oriented and connectionless services in the Network Layer. | CO3 | E | 10 |
|  |  |  |  |  |  |
| 5. |  | Apply the Dijkstra’s algorithm to find the shortest path from node A to D in the given network graph. | CO4 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Apply the Distance Vector Routing algorithm to the given network topology and determine the routing table for the routers. | CO4 | A | 20 |
|  |  |  |  |  |  |
| 7. | a. | Analyze the role of the Transport Layer in ensuring reliable end-to-end communication through suitable examples. | CO5 | An | 10 |
|  | b. | Apply the steps involved in Domain Name System resolution when a user enters a Uniform Resource Locator in a web browser. | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Analyze the impact of congestion control mechanisms in Transmission Control Protocol on network performance. | CO5 | An | 10 |
|  | b. | Apply Dynamic Host Configuration Protocol to explain how a device obtains an Internet Protocol address dynamically in a network. | CO5 | A | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Analyze the challenges of IPv4 address exhaustion and how IPv6 addresses this issue with suitable examples. | CO6 | An | 10 |
|  | b. | Compare the header structures of IPv4 and IPv6, highlighting the significant differences and justifying their effects on network performance. | CO6 | An | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Examine the necessity for computer networks. |
| CO2 | Analyze the requirement of the physical layer. |
| CO3 | Infer the essentials of the data link layer. |
| CO4 | Review the issues in the network layer. |
| CO5 | Express the need of transport and application layer. |
| CO6 | Identify the necessity for transition from ipv4 to ipv6 addressing. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA2008** | **Duration** | **3hrs** |
| **Course Title** | **OPERATING SYSTEM SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Describe the working of an assembler. | CO1 | R | 10 |
|  | b. | Illustrate the architecture of an operating system and structure of a computer system with examples. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Discuss the components of an operating system, with a focus on secondary storage management, security management, and the command interpreter system, using suitable diagrams. | CO2 | U | 10 |
|  | b. | Examine the different types of storage structures in a computer system. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 3. | a. | Discuss the different process states in an operating system. | CO3 | U | 10 |
|  | b. | Articulate the concepts of deadlock prevention, avoidance, and detection. | CO3 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the types of schedulers in an operating system. | CO4 | A | 10 |
|  | b. | Illustrate the role of threat monitoring in operating system security. | CO4 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the primary goals of kernel land attack techniques and their common execution methods. | CO5 | A | 10 |
|  | b. | Examine memory corruption vulnerabilities and their types. | CO6 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Dissect the causes of buffer overflow vulnerabilities and categorize their different types. | CO1 | An | 10 |
|  | b. | Describe the functions, applications, and types of application software. | CO1 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Examine the approaches used for contiguous memory allocation. | CO3 | A | 10 |
|  | b. | Discuss the purpose of a batch system along with its advantages and disadvantages. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate the concept of race condition with relevant example. | CO5 | A | 10 |
|  | b. | Discuss the concept of security authentication and its importance. | CO4 | R | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Examine the common services provided by an operating system. | CO2 | A | 10 |
|  | b. | Examine the implementation of an access matrix in an operating system. | CO4 | A | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Examine the operating system concepts. |
| CO2 | Categorize the operating system structure and its storage hierarchy. |
| CO3 | State the features of process management. |
| CO4 | Recognize the capability in handling protection mechanism and storage. |
| CO5 | Describe the operating system security and protection mechanism. |
| CO6 | Examine the possible vulnerabilities in kernel. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA2018** | **Duration** | **3hrs** |
| **Course Title** | **WEB DEVELOPMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the client-server communication process in web applications. | CO1 | U | 10 |
|  | b. | Write HTML code to create frames where the left frame contains a navigation menu and the right frame displays content. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Write HTML code to create form that collects name, email-id, gender (radio button) and country. | CO1 | A | 10 |
|  | b. | Explain the types of list in HTML with an example code. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Write a HTML code to create a table that contains the details of at-least five students (Name, Register number, Marks for five subjects) using CSS properties. | CO2 | A | 12 |
|  | b. | Compare XML and JSON in terms of data representation, readability, and usage. | CO2 | An | 6 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Write a JavaScript to design a simple calculator to perform the following operations:  a. Sum  b. Product  c. Difference and  d. Quotient. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 5. | a. | Write JavaScript to create an HTML button to change the background color of the page when clicked. | CO3 | A | 10 |
|  | b. | Explain conditional statements in JavaScript with example. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Write a JavaScript that checks if a **user’s age is greater than 18** and prints the eligibility criteria to vote. | CO4 | A | 10 |
|  | b. | Explain the types of arrays in JavaScript with suitable example. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the advantages of using Servlets over other web technologies. | CO5 | U | 10 |
|  | b. | Write a Servlet that demonstrates user login using **HttpSession.** | CO5 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the differences between **client-side storage** and **server-side storage** in web applications | CO5 | U | 10 |
|  | b. | Compare JavaBeans with Servlets in terms of **state management and reusability.** | CO6 | An | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Develop a JSP page that collects **user login details** and validates them using a **Servlet.** | CO6 | C | 10 |
|  | b. | Explain the importance of **JSP directives** with examples. | CO6 | U | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the client-server communication protocols. |
| CO2 | Design simple web pages using markup languages like HTML and XHTML. |
| CO3 | Develop web pages using XML/XSLT. |
| CO4 | Design and understand the concept of Cascading Style Sheets. |
| CO5 | Develop the Server-side programming using servlets. |
| CO6 | Summarize the concept of JSP. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA2020** | **Duration** | **3hrs** |
| **Course Title** | **SECURITY ASSESSMENT OF INFORMATION SYSTEMS THROUGH ETHICAL HACKING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Describe the following concepts briefly with an example.   1. Ping sweep b. Keylogger c. MitM d) Pay Load e) Bot | CO1 | U | 15 |
|  | b. | List the elements of Information Security with suitable example. | CO1 | R | 5 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Evaluate the various activities performed by hackers at various phases of hacking during a penetration test. | CO1 | E | 15 |
|  | b. | Classify Trojans and Backdoors and write description of its working. | CO2 | An | 5 |
|  |  |  |  |  |  |
| 3. | a. | Analyze the phases involved in ethical hacking and explain how each phase contributes to identifying and addressing security vulnerabilities. | CO2 | An | 15 |
|  | b. | List any five footprinting tools. | CO2 | R | 5 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Analyze the effectiveness of various footprinting tools, such as search engines, WHOIS databases, and network scanning tools. How do these tools aid in gathering sensitive information, and what are their potential limitations? | CO3 | An | 15 |
|  | b. | Distinguish between ping and ping sweep. | CO4 | R | 5 |
|  |  |  |  |  |  |
| 5. | a. | Apply your knowledge to describe the top 10 Windows vulnerabilities, analyze their potential impacts on system security, and propose effective methods for mitigating these risks. | CO3 | A | 12 |
|  | b. | List five tools commonly used for identifying vulnerabilities in Windows and Linux operating systems. | CO3 | R | 8 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain how an RPC works in a networked environment and how Null Sessions can be used to exploit vulnerabilities in Windows systems. | CO4 | U | 10 |
|  | b. | Examine the tools to be used, and how would you go about gathering DNS records (such as A, MX, and NS records) for a given domain for performing **DNS enumeration** on a domain? | CO4 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain the concept of password cracking and describe the differences between various types of password cracking attacks, such as brute force, dictionary attacks, and rainbow table attacks. How does each method work, and in what scenarios might each be used? | CO5 | R | 15 |
|  | b. | Analyze the different methods for protecting a system from hacking. Discuss the effectiveness of various security measures, such as firewalls, encryption, multi-factor authentication, and regular software updates, in mitigating different types of cyber threats. | CO5 | An | 5 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain cross-site scripting (XSS) and its two types of variants. | CO5 | U | 10 |
|  | b. | Discuss about web application hacking methodology. | CO6 | U | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Compare the various types of wireless attacks. | CO6 | An | 10 |
|  | b. | Explain various types of IEEE standard 802.11 and compare its properties. | CO6 | A | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Express knowledge on basics of computer-based vulnerabilities. |
| CO2 | Describe different foot printing, reconnaissance and scanning methods. |
| CO3 | Demonstrate the enumeration and vulnerability analysis methods. |
| CO4 | Apply hacking options available in Web and wireless applications. |
| CO5 | Demonstrate tools to perform ethical hacking to expose the vulnerabilities. |
| CO6 | Analyze the digital evidence. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **DATABASE SECURITY** | **Duration** | **3hrs** |
| **Course Title** | **23CA2022** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Describe the different normalization techniques in detail. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2 |  | Explain the Entity-Relationship (E-R) model in detail and illustrate it with an E-R diagram for a student fee payment system. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. |  | Write in detail about the structure of database architecture. | CO1 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Illustrate the authentication technologies used in banking with real-world scenarios. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 5. | a. | Explain user roles, profiles, and password policies. | CO3 | U | 10 |
|  | b. | Illustrate the use of Data Manipulation Languages (DML) in a Student Information System. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Describe the database security measures implemented in a hospital management system. | CO4 | U | 20 |
|  |  |  |  |  |  |
| 7. | a. | Describe the different states of a transaction. | CO4 | U | 10 |
|  | b. | Construct a method to encrypt device information using your name as sample data. | CO4 | C | 10 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Explain the backup and recovery strategies in banking sector. | CO6 | A | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Interpret database auditing practices in life insurance sector. | CO5 | U | 10 |
|  | b. | Analyze in detail the different levels of RAID. | CO6 | An | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA2024** | **Duration** | **3hrs** |
| **Course Title** | **INCIDENT RESPONSE MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Explain the primary goals of incident response and how they contribute for effective cybersecurity management. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Analyze the key steps involved in preparing for a forensic analysis and their impact on the accuracy of an investigation. | CO1 | An | 20 |
|  |  |  |  |  |  |
| 3. |  | Articulate the process of live data collection from Windows systems and explain its significance in forensic investigations. | CO2 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Interpret your knowledge of file systems and storage layers to explain how data is organized and retrieved in digital forensics. | CO3 | A | 10 |
|  | b. | Evaluate the effects of different techniques used for recovering deleted files in a Windows system. | CO3 | E | 10 |
|  |  |  |  |  |  |
| 5. |  | Explain the process of performing static analysis on a hacker tool and its role in cybersecurity investigations. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Analyze the key guidelines for effective report writing and their impact on clarity and accuracy in forensic investigations. | CO5 | An | 20 |
|  |  |  |  |  |  |
| 7. |  | Evaluate the effectiveness of reviewing pertinent log files in identifying security incidents and anomalies. | CO5 | E | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Determine the best methods for obtaining volatile data before powering down a system and justify their importance in forensic investigations. | CO6 | A | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Distinguish between different response toolkit tools and their specific roles in incident handling. | CO6 | E | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the aspects of incident response process. |
| CO2 | Describe data collection procedures. |
| CO3 | Apply the art of data analysis. |
| CO4 | Apply the investigating procedures to analysis hacker tools and routers. |
| CO5 | Summarize about the computer forensic report writing. |
| CO6 | Summarize about data recovery procedure. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA2025** | **Duration** | **3hrs** |
| **Course Title** | **FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Interpret the roles of various components in the structure of intelligent agents. | CO1 | A | 10 |
|  | b. | Examine the differences between discrete and continuous data in real-world applications. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe the minimax search algorithm in the context of game playing. | CO2 | R | 10 |
|  | b. | Explain the game of Backgammon and the approaches used in Stochastic Games. | CO2 | An | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain the concept of decision tree in machine learning. | CO3 | U | 10 |
|  | b. | Illustrate the different types of software agent. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Examine the process of speech recognition in artificial intelligence and explore its applications. | CO4 | A | 10 |
|  | b. | Describe the key approaches in machine translation and their applications. | CO4 | R | 10 |
|  |  |  |  |  |  |
| 5. | a. | Illustrate the role of deep learning in modern artificial intelligence applications with examples. | CO5 | U | 10 |
|  | b. | Construct a diagram to articulate the architecture and working of a recurrent neural network. | CO6 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the characteristics of an intelligent agent. | CO1 | U | 10 |
|  | b. | Differentiate passive and active reinforcement learning. | CO5 | An | 10 |
|  |  |  |  |  |  |
| 7. | a. | Describe the applications of supervised learning in real-world scenarios. | CO3 | U | 10 |
|  | b. | Articulate the process of implementing constraint propagation. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Discuss the various applications of artificial intelligence. | CO4 | U | 10 |
|  | b. | Categorize the steps and components of natural language processing with relevant examples. | CO4 | An | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain the uses of agents and provide examples along with their PEAS representation. | CO1 | U | 10 |
|  | b. | Discuss the concept of supervised learning. | CO3 | U | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the foundations of artificial intelligence. |
| CO2 | Apply artificial intelligence for problem solving. |
| CO3 | Illustrate the role software agents in artificial intelligence. |
| CO4 | Apply artificial intelligence to solve real world problems. |
| CO5 | Outline the concepts of neural networks. |
| CO6 | Analyze the working principles of recurrent neural networks |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA2030** | **Duration** | **3hrs** |
| **Course Title** | **LINUX ADMINISTRATION AND PROGRAMMING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Describe the File System Hierarchy Standard starting from the root directory, and identify the purpose of each key sub-directory. | CO1 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the basic structure and features of the Bash shell. Illustrate how it can be used for file manipulation and system management tasks. | CO1 | R | 10 |
|  | b. | Explain the common log files generated by Rsyslog and their significance in system monitoring. | CO1 | R | 10 |
|  |  |  |  |  |  |
| 3. | a. | Examine the various types of files supported by Linux. Differentiate their purposes and usage. | CO2 | A | 14 |
|  | b. | With suitable example create a tar archive of the /etc/systemd directory. | CO2 | C | 6 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Illustrate purpose of the RPM package management system in Linux. | CO3 | A | 14 |
|  | b. | Compare gzip and gunzip commands. | CO3 | An | 6 |
|  |  |  |  |  |  |
| 5. | a. | Describe the boot process of a Linux operating system, from power-on to the login prompt. | CO3 | U | 12 |
|  | b. | Analyze the different run levels and explain their benefits in terms of system functionality and resource management. | CO4 | An | 8 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Categorize the various common Shell Commands with suitable examples. | CO4 | An | 10 |
|  | b. | Summarize the use of “vim” editor to edit and manipulate text files with various keystrokes | CO4 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | With appropriate command schedule jobs that will be carried out for you on a regular schedule. Discuss with 3 examples. | CO5 | A | 12 |
|  | b. | Summarize the various commands used to manage Users and Groups from the Command Line with suitable examples. | CO5 | E | 8 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Apply the steps to configure an NFS server and client in Linux. Demonstrate how to mount shared directories on the NFS client and verify the connection between the client and the server. | CO5 | A | 12 |
|  | b. | Explain the concept of Access Control Lists (ACLs) in Linux and describe the ACL check algorithm. | CO6 | R | 8 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Design a RAID configuration for a new Linux server. | CO6 | C | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | List various Linux commands and its flavours |
| CO2 | Examine the remote administration and secure system boot up process. |
| CO3 | Relate process management, identity and security. |
| CO4 | Apply network security policies. |
| CO5 | Create and manage storage devices. |
| CO6 | Examine the file system and storage management. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3009** | **Duration** | **3hrs** |
| **Course Title** | **CYBER SECURITY AUDIT AND COMPLIANCE** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the evolution of security programs and their significance in modern organizations. | CO1 | U | 10 |
|  | b. | Apply the concept of security governance fusion to an organization's security framework by illustrating its implementation and impact on risk management and compliance. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the role of orchestration in managing security governance. | CO2 | U | 10 |
|  | b. | Summarize the key principles of security governance. | CO2 | E | 10 |
|  |  |  |  |  |  |
| 3. | a. | Illustrate workplace irregularities and illegal acts with examples. | CO3 | A | 10 |
|  | b. | Define delegation and analyze the responsibilities of a delegate. | CO3 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the role of technology deployment in security governance. | CO4 | U | 10 |
|  | b. | Analyze the components of an entity’s control environment and their impact on security governance. | CO4 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Apply audit controls to assess and enhance human resource security in an organization. | CO5 | A | 10 |
|  | b. | Develop a comprehensive Information Security Incident Management plan by integrating key aspects of incident detection, response, recovery, and prevention. Justify the inclusion of each component. | CO5 | C | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Explain the five core functions of security governance and discuss the benefits of implementing security governance policies. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 7. | a. | Apply the ISG audit planning process to assess an organization's security framework. | CO4 | A | 10 |
|  | b. | Explain the process of studying and evaluating ISG Audit controls. Discuss how these controls contribute to an organization's overall security governance framework. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Analyze the key principles of Information Security Policies and evaluate their role in strengthening an organization’s security framework. | CO6 | An | 10 |
|  | b. | Illustrate how an organization can implement Human Resource Security controls (ISO/IEC 27001, A.7) to prevent insider threats. | CO6 | A | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Apply the concept of compliance in ISO/IEC 27001 (A.18) to ensure an organization meets regulatory and legal security requirements. Identify key steps and provide examples. | CO6 | A | 10 |
|  | b. | Design an improved Information Security Incident Management framework based on ISO/IEC 27001 (A.16) to enhance cybersecurity risk mitigation. Propose key components and justifications for their inclusion. | CO6 | C | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | State the importance of security governance. |
| CO2 | Tabulate various Information Security governance policies. |
| CO3 | Plan the Information Security Governance Audit. |
| CO4 | Practice Information Security Policies. |
| CO5 | Devise Information Security Incident Management act. |
| CO6 | Administer the ISG Audit Controls. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3010** | **Duration** | **3hrs** |
| **Course Title** | **NETWORK FORENSICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Analyze the functions of each layer in the OSI reference model and their roles in ensuring effective network communication. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Differentiate between guided transmission media and wireless transmission, highlighting their advantages and limitations. | CO1 | U | 20 |
|  |  |  |  |  |  |
| 3. |  | Evaluate the reliability and significance of log-based evidence in forensic investigations. | CO2 | E | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Apply Wireshark essentials to capture, analyze and interpret network traffic for forensic investigations. | CO2 | A | 20 |
|  |  |  |  |  |  |
| 5. |  | Analyze the differences in packet structure and communication behaviour between TCP and UDP protocols. | CO3 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the concept of Statistical Flow Analysis and its role in identifying network traffic patterns and anomalies. | CO3 | U | 10 |
|  | b. | Evaluate the characteristics and impact of Good, Known, and Ugly malware in cybersecurity investigations. | CO4 | E | 10 |
|  |  |  |  |  |  |
| 7. |  | Apply forensic techniques to investigate Command and Control (C2) servers and analyze their role in cyber threats. | CO4 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Analyze the methodologies and challenges involved in conducting WLAN forensics to detect and mitigate wireless security threats. | CO5 | An | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Evaluate the effectiveness of investigating and analyzing logs in detecting and responding to security incidents. | CO6 | E | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the key concepts of network anomalies and behavior. |
| CO2 | Analyze the requirement of Deep Packet Inspection. |
| CO3 | Elaborate the need for investigating network behavior and patterns in relation to malware. |
| CO4 | Summarize the variety of log types and gathering inputs to ultimately aid your network forensics exercises. |
| CO5 | Focus on developing methodologies to automate processing of large evidence set. |
| CO6 | Examine the log files for investigations. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3012** | **Duration** | **3hrs** |
| **Course Title** | **DATABASE SECURITY MANAGEMENT** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Analyze the different normal forms (1NF to 5NF) and their role in reducing data redundancy. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Design a relational data model for an e-commerce application and justify the choice of entities, attributes, and relationships. | CO1 | C | 20 |
|  |  |  |  |  |  |
| 3. |  | Compare FHE-based PIR with other privacy-preserving retrieval methods in terms of efficiency, security, and scalability. | CO2 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Evaluate the impact of data breaches on businesses, consumers, and regulatory compliance. | CO2 | E | 20 |
|  |  |  |  |  |  |
| 5. |  | Analyze the risks and challenges associated with improper granting and revoking of privileges in multi-user database environments. | CO3 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Apply SQL injection testing techniques on a sample database and explain how vulnerabilities can be detected and mitigated. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 7. |  | Compare on-site and off-site backup solutions, assessing their advantages, limitations, and cost-effectiveness. | CO4 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Apply role-based and group-based authorization techniques to a healthcare management system. | CO5 | A | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Evaluate the role of database auditing models in ensuring data security and regulatory compliance. | CO6 | E | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Describe database concepts |
| CO2 | Summarize the 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. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3014** | **Duration** | **3hrs** |
| **Course Title** | **FORENSICS OF EMBEDDED SYSTEM** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Examine the functions carried out by the various layers of PCB in detail. | CO1 | A | 10 |
|  | b. | Interpret the given graph according to Gordon Moore’s law. | CO1 | A | 5 |
|  | c. | State the factors that predict the growth of embedded systems. | CO1 | R | 5 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe the different parts of a PLC and write short notes on its applications. | CO1 | R | 10 |
|  | b. | Review the advantages and limitations of the flash memory. | CO1 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Define a boot loader. Differentiate between the embedded system and PC boot loaders. | CO2 | R | 10 |
|  | b. | Interpret the various operating modes of boot loaders. | CO2 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Illustrate the various phases of UFM for the analysis of the embedded systems. | CO3 | U | 10 |
|  | b. | Apply the Reverse Engineering methodology in the development of the embedded system. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 5. |  | Differentiate between computer forensics and mobile forensics. Predict the challenges of mobile forensics. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Summarize the different operating modes of iOS devices. | CO3 | E | 20 |
|  |  |  |  |  |  |
| 7. |  | Discuss the various components of ICS with a neat sketch on its architecture diagram. | CO5 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Recognize the significance of emulation in the forensic analysis of embedded system. | CO6 | R | 10 |
|  | b. | Generalize the processes performed in the router forensics. | CO6 | U | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Correlate the impact of Stuxnet on smart device forensics. | CO4 | An | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | identify different PCB Concepts. |
| CO2 | extract data from Smart devices. |
| CO3 | perform forensic analysis on embedded devices. |
| CO4 | acquire and analyze Smart Device internal memory. |
| CO5 | analyze the ingredients of Firmware Forensics Analysis. |
| CO6 | summarize the usage of various forensic tools and techniques. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3015** | **Duration** | **3hrs** |
| **Course Title** | **ARTIFICIAL INTELLIGENCE SECURITY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the role of artificial intelligence tools in different domains such as personal use, business applications, and healthcare. | CO1 | A | 10 |
|  | b. | Identify the limitations of artificial intelligence. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Explain the concept of classification and its types. | CO2 | U | 10 |
|  | b. | Explain the machine learning lifecycle in detail. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 3. | a. | Appraise the structure and performance of a feedforward neural network. | CO3 | An | 10 |
|  | b. | Discuss the process of training an artificial neural network with backpropagation. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Determine how fake login pages work and how organizations can effectively handle them. | CO4 | A | 10 |
|  | b. | Explain the key components of a face recognition system and discuss its implementation process. | CO4 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Describe the role of ontology in digital forensics and its impact on forensic investigations. | CO5 | U | 10 |
|  | b. | Describe intrusion detection ontology and its significance in cybersecurity. | CO5 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the common causes of data breaches and their preventive measures. | CO5 | A | 10 |
|  | b. | Explain the performance and tasks involved in data cleaning. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Describe the architecture and functioning of convolutional neural networks with suitable examples. | CO3 | R | 10 |
|  | b. | Explain the types of datasets, common methods used in data processing, and key features considered in dataset preparation for machine learning. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the architecture and working of deep recurrent networks with suitable examples. | CO3 | A | 10 |
|  | b. | Explain the techniques and algorithms used for botnet detection in network security. | CO4 | An | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Describe the key approaches to artificial intelligence. | CO1 | U | 10 |
|  | b. | Identify methods to detect, prevent, and protect against fake account creation. | CO4 | R | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Acquire the fundamental concepts of Artificial Intelligence. |
| CO2 | explain different network types, IP address, sub-netting, network address translation and IP versions4 to IPv6. |
| CO3 | Compare the current level of interconnection with different devices. |
| CO4 | State the important role in terms of the protection of sensitive user related information. |
| CO5 | Identify the security attacks and data breaches. |
| CO6 | Discuss the strategic defense mechanism for malware, addressing cybercrime, and assessing vulnerabilities to yield proactive rather than reactive countermeasures. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3016** | **Duration** | **3hrs** |
| **Course Title** | **MALWARE ANALYSIS AND FORENSICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the types of malware categories with examples. | CO1 | U | 10 |
|  | b. | Compare the effectiveness and features of static analysis with that of dynamic analysis with respect to real-time applications. | CO1 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Analyze the efficiency of a static analysis tool in checking security vulnerabilities. | CO2 | An | 10 |
|  | b. | Analyze the challenges faced in static analysis with real-time examples. | CO2 | An | 10 |
|  |  |  |  |  |  |
| 3. | a. | Analyze the malware category using process monitor in dynamic malware analysis. | CO3 | An | 10 |
|  | b. | Illustrate the key components of the sandboxing in malware analysis with examples. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Classify the different types of instructions commonly encountered in Assembly Language and windows DLLs and explain their features, advantages and disadvantages based on malware analysis. | CO4 | An | 10 |
|  | b. | Illustrate a case study on malware attack using powershell. | CO4 | A | 10 |
|  |  |  |  |  |  |
| 5. | a. | Explain the role of breakpoints in debugging malware execution. | CO5 | U | 10 |
|  | b. | Assess the impact of code modification on malware execution flow. | CO5 | E | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Analyze the output of a static analysis report and categorize the detected issues based on severity. | CO2 | An | 20 |
|  |  |  |  |  |  |
| 7. | a. | Describe the significant malware propagation techniques with examples. | CO1 | U | 10 |
|  | b. | Analyze a program behavior under different test conditions using dynamic analysis. | CO4 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Describe the purpose of malware debugging with OllyDbg and WinDbg. | CO6 | R | 10 |
|  | b. | Illustrate a scenario of malware behavior by reading from memory in WinDbg. | CO6 | An | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Illustrate a case study involving modifying program execution in malware analysis. | CO6 | A | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Classify the types of malwares and its analysis techniques. |
| CO2 | Compare the malware samples and extract strings, functions, and metadata associated with the file. |
| CO3 | Simulate various analysis tools to understand the functioning of malware. |
| CO4 | Dissect and reverse engineering malware. |
| CO5 | Identify and correlate all the log data generated by analysis tools to process a malware. |
| CO6 | Discuss the challenges encountered in malware analysis. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3022** | **Duration** | **3hrs** |
| **Course Title** | **SECURITY IN THE CLOUD** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Describe the different cloud deployment models and their characteristics. | CO1 | R | 10 |
|  | b. | Explain the fundamental concepts of cloud security and their role in protecting data and applications. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Identify the privacy issues in cloud and the necessity of cloud security and discuss their potential impact on data protection. | CO2 | R | 10 |
|  | b. | Examine the various cloud security controls and their effectiveness in protecting data. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 3. | a. | Explain the concept of a TVM-based Intrusion Detection System and its disadvantages. | CO3 | A | 10 |
|  | b. | Explain the working of Distributed Intrusion Detection Systems and discuss their challenges. | CO3 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the importance of data identification and classification in protecting sensitive information. | CO4 | A | 10 |
|  | b. | Discuss the role of data protection strategies and the challenges encountered in cloud data security. | CO4 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Classify the different types of authorization methods used in cloud security. | CO5 | U | 10 |
|  | b. | Explain the key concepts of network security. | CO5 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain the significance of network access control in preventing unauthorized access. | CO5 | U | 10 |
|  | b. | Explain the different types of threats in cloud computing. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | Dissect the CSA Cloud Reference Model and correlate it with its role in defining cloud security architecture. | CO1 | An | 10 |
|  | b. | Explain the taxonomy of attacks in cloud environments and their potential risks. | CO2 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Illustrate the working of Network-based Intrusion Detection Systems and the challenges they face in securing network traffic. | CO3 | A | 10 |
|  | b. | Examine different tagging strategies in cloud asset management. | CO4 | A | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Examine the major challenges in cloud security and their implications for data protection. | CO1 | A | 10 |
|  | b. | Classify the different types of Intrusion Detection Systems (IDS) in cloud environments. | CO3 | U | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Demonstrate a solid understanding of the concepts and principles of cloud computing. |
| CO2 | Identify and address cloud security and privacy issues. |
| CO3 | Implement intrusion detection systems and techniques in the cloud. |
| CO4 | Develop the ability to manage and protect cloud assets, including virtual machines, data storage and network resources |
| CO5 | Implement identity and access management in the cloud |
| CO6 | Assess and enhance cloud security posture. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3027** | **Duration** | **3hrs** |
| **Course Title** | **ARTIFICIAL INTELLIGENCE TECHNIQUES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the concept of Artificial Intelligence and outline its diverse applications. | CO6 | U | 10 |
|  | b. | Apply Artificial Intelligence techniques to solve the Tower of Hanoi problem. | CO6 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Analyze the movement of a robot in a two-dimensional world within a stimulus-response agent environment. | CO1 | An | 20 |
|  |  |  |  |  |  |
| 3. |  | Describe the various types of agents in Artificial Intelligence. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Compare the characteristics and functioning of Table-driven agents with Simple reflex agents. | CO2 | An | 20 |
|  |  |  |  |  |  |
| 5. |  | Apply the Breadth-First Search (BFS) algorithm to traverse the given graph and explain the working principles of the algorithm. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Create a PEAS (Performance measure, Environment, Actuators, and Sensors) framework model for an automated car driving system in Artificial Intelligence. | CO4 | C | 20 |
|  |  |  |  |  |  |
| 7. |  | Apply the Travelling Salesman Algorithm to solve the given graph, determine the total cost, and explain how the algorithm functions. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Demonstrate the rules of inference and semantics in Propositional Calculus with suitable examples. | CO6 | U | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Examine various agent architectures in detail, highlighting their key features and functionalities. | CO5 | An | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | illustrate various approaches and thinking capabilities of AI. |
| CO2 | describe different agents and its behaviour. |
| CO3 | summarize the types of searching algorithms. |
| CO4 | apply logical thinking in implementing complete AI. |
| CO5 | describe various agent architectures in AI. |
| CO6 | analyse different mechanisms in developing AI applications. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3036** | **Duration** | **3hrs** |
| **Course Title** | **DATA ANALYTICS AND VISUALIZATION** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Differentiate the impact of various Gestalt principles on data visualization effectiveness. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Compare and contrast the use cases of a stacked bar chart, a sankey diagram, and a waterfall chart. | CO2 | An | 20 |
|  |  |  |  |  |  |
| 3. |  | Illustrate data distribution using histograms and pyramid charts. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Analyze how visualizations show uncertainty in data, like error bars or confidence intervals. | CO4 | An | 20 |
|  |  |  |  |  |  |
| 5. |  | Summarize the concept of a network diagram and create a detailed chart as an example. | CO5 | E | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Explain the following in detail: (i) Diverging Bar (ii) Dot Plot (iii) Box and Whisker Plot. | CO4 | U | 20 |
|  |  |  |  |  |  |
| 7. |  | Apply the principles of form and function to create effective data visualizations. | CO1 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Evaluate the effectiveness of common color palettes and word trees in design. | CO6 | E | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | List ten key guidelines for creating better tables and explain their importance in effective design. | CO6 | R | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Examine principles of data visualization. |
| CO2 | Interpret the insights of data using various charts. |
| CO3 | Sketch timeline and distribution charts. |
| CO4 | Classify the types of charts and their usage. |
| CO5 | Interpret timeline and geospatial charts. |
| CO6 | Visualize qualitative data. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| --- | --- | --- | --- |
| **Course Code** | **23CA3038** | **Duration** | **3hrs** |
| **Course Title** | **ADVANCED DATABASE TECHNOLOGIES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the different types of failures in database systems. How does failure classification help in designing recovery techniques? | CO1 | U | 10 |
|  | b. | A banking system maintains transactional records. Due to a sudden power failure, some transactions remain incomplete. As a database administrator, explain the recovery mechanisms you will implement using ARIES to ensure transaction atomicity and durability. | CO1 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Describe the role of commit protocols in distributed databases. How do they ensure consistency and reliability in distributed transactions? | CO1 | R | 10 |
|  | b. | Explain the importance of concurrency control in distributed databases. Discuss different concurrency control techniques used in distributed environments. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. |  | A weather forecasting agency uses simulation software that processes massive amounts of climate data to predict weather patterns. The current system based on sequential processing takes several hours to generate the forecast. The agency plans to migrate to a parallel processing system to improve performance. Analyze how the transition to a parallel system can enhance the application’s efficiency. | CO2 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Explain how distributed query processing techniques can enhance database performance in a multinational company with geographical distributed databases, focusing on efficient query execution. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 5. | a. | Describe how datamining can be performed in different forms of data. | CO3 | U | 10 |
|  | b. | A database designer is deciding between object-oriented mapping and object-relational mapping for a multimedia management system. Analyze the key differences, advantages, and limitations of both approaches. | CO4 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Explain how object-relational mapping techniques can be used to implement object oriented features efficiently in an e-commerce system that uses object-oriented features for storing complex datatypes. | CO4 | U | 10 |
|  | b. | Analyze the advantages, challenges, and performance implications in a financial organization that uses native XML databases and relational databases with XML support for storing XML data. | CO4 | An | 10 |
|  |  |  |  |  |  |
| 7. | a. | Explain how XML querying and transformation techniques can be applied to enhance data processing in an e-commerce company that stores product data in XML format and wants to retrieve and transform this data efficiently. | CO5 | A | 10 |
|  | b. | Describe XML document schema. How does it ensure data integrity and validation in XML-based applications? | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | Explain the benefits of using persistent programming language with example. | CO5 | U | 10 |
|  | b. | Compare main-memory databases with real-time transaction systems and analyze their effectiveness in handling high workloads. | CO6 | An | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain how spatial databases can be applied to optimize a tracking and delivery system in a logistics company that wants to track real-time deliveries using spatial and geographic data. | CO6 | A | 10 |
|  | b. | Analyze the challenges in managing mobility and personal databases compared to traditional databases in a mobile application which stores personal user data, including multimedia content and location-based information. | CO6 | An | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Understand the recovery system. |
| CO2 | Summarize about parallel database, distributed database, data mining and data warehousing. |
| CO3 | Design the information retrieval system and specialty database. |
| CO4 | Develop advanced application for real world. |
| CO5 | Demonstrate about the XML technologies |
| CO6 | Facilitate students to understand the concept of transaction processing, spatial and temporal data. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3039** | **Duration** | **3hrs** |
| **Course Title** | **HUMAN CENTERED COMPUTING** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Explain the Norman’s model of interaction with real-time examples. | CO1 | A | 10 |
|  | b. | Describe the aspects of ergonomics with examples. | CO1 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | Compare participatory design with navigation design. | CO2 | An | 10 |
|  | b. | Describe the characteristics of Interaction design. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | Apply the principles of windowing systems to design a user-friendly desktop interface for a productivity application. | CO3 | A | 10 |
|  | b. | Classify between user-centered design and system-centered design. | CO3 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Illustrate the concept of cognitive models with real-time examples. | CO4 | A | 10 |
|  | b. | Analyze the advantages and limitations of face-to-face communication compared to digital communication in HCI. | CO4 | An | 10 |
|  |  |  |  |  |  |
| 5. | a. | Examine the characteristics, advantages and disadvantages of Groupware systems. | CO5 | R | 10 |
|  | b. | Analyze the key frameworks for groupware with real-world examples. | CO5 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | Describe the ethical implications of AI in Human-Centered Computing. | CO3 | R | 10 |
|  | b. | Explain the concept of client server architecture. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 7. | a. | Describe the common interface styles with examples. | CO1 | R | 10 |
|  | b. | Illustrate the four basic activities in interaction design with real-time applications. | CO2 | A | 10 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Apply the concept of ubiquitous computing in real-time applications. | CO6 | A | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Illustrate a case study on augmented reality technology related to a real-world problem in the construction industry. | CO6 | An | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | Interpret necessity of human computer interaction. |
| CO2 | Identify the suitable design process for developing an interaction model. |
| CO3 | Classify types of design models. |
| CO4 | Devise strategies for deployment of interaction models. |
| CO5 | Choose the right type of interaction model. |
| CO6 | Compare different kinds of human computer interaction models. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **23CA3040** | **Duration** | **3hrs** |
| **Course Title** | **MODELLING TECHNIQUES IN PREDICTIVE ANALYTICS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Compare business intelligence with predictive analytics. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Discuss the steps involved in the predictive analytics process. | CO2 | U | 20 |
|  |  |  |  |  |  |
| 3. |  | Paraphrase the concept of descriptive modeling in detail. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Describe the CRISP-DM process in detail and explain its significance in the healthcare sector. | CO4 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Demonstrate the data preparation process in detail for a banking application. | CO2 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Explain the concept of logistic regression in detail and demonstrate its application in fraud detection for the banking sector. | CO3 | U | 20 |
|  |  |  |  |  |  |
| 7. |  | Describe the concept of Principal Component Analysis (PCA) and demonstrate its application in patient data analysis within the healthcare sector. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Describe ensemble methods that minimize both variance and bias, and explain their effectiveness in predictive modeling. | CO5 | U | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Analyze the application of predictive analytics in solving real-world problems. | CO6 | An | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3042** | **Duration** | **3hrs** |
| **Course Title** | **INTERNET OF THINGS AND BLOCKCHAIN TECHNOLOGY** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Analyze the challenges faced in implementing sensors in IoT applications. | CO1 | An | 10 |
|  | b. | Analyze the different QoS levels in MQTT and evaluate their impact on message delivery, reliability, and performance in IoT applications. | CO1 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Categorize the protocols used for communication in IoT networks and explain the working of the different protocols in each category. | CO1 | An | 20 |
|  |  |  |  |  |  |
| 3. |  | Explain the key concepts of Amazon Web Services (AWS) and analyze the significance of its core services and specialized services for IoT analytics. | CO2 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Explain the features of parallel programming and justify that they provide the most appropriate functionalities for big data processing. | CO2 | U | 10 |
|  | b. | Choose a sample text document with at least 5 sentences and apply map reduce to count the occurrences of each word in the above document. | CO2 | A | 10 |
|  |  |  |  |  |  |
| 5. |  | Explain the significance of data visualization in different scenarios and discuss the different types of visualization. | CO3 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Justify that R is a suitable tool for statistical analysis. | CO3 | E | 20 |
|  |  |  |  |  |  |
| 7. |  | Explain the architecture of blockchain technology by exploring its decentralized framework, the function of nodes, blocks, and consensus mechanisms. Illustrate how blockchain ensures immutability, transparency, and security in data handling. | CO4 | U | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Analyze the significance of consensus algorithms in blockchain technology and explain the different consensus algorithms used in blockchains. | CO4 | An | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Classify the types of bitcoin wallets and their role in cryptocurrency transactions. | CO5 | An | 10 |
|  | b. | Evaluate how cryptocurrency transactions serve as a secure alternative to traditional currency in today’s digital economy. | CO6 | E | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Analyze various iot protocols. |
| CO2 | Summarize the various cloud data analytic services to iot. |
| CO3 | Deploy iot applications and connect to the cloud. |
| CO4 | Summarize the fundamentals of blockchain. |
| CO5 | Build bitcoin wallets for ecommerce. |
| CO6 | Analyze the applications of iot and bitcoin in real-world scenarios. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3043** | **Duration** | **3hrs** |
| **Course Title** | **Image Processing and Computer Vision** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Apply color image processing techniques to enhance and modify an image for better visualization. | CO1 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Create an edge detection algorithm to identify object boundaries in an image using OpenCV. | CO1 | C | 20 |
|  |  |  |  |  |  |
| 3. |  | Evaluate the accuracy of Canny edge detection compared to other edge detection methods in OpenCV. | CO2 | E | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Create an OpenCV-based GUI application that processes images and allows real-time shape detection. | CO2 | C | 20 |
|  |  |  |  |  |  |
| 5. |  | Apply spatial filtering techniques to reduce noise in an image while preserving important details. | CO3 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Evaluate the performance of inverse filtering and minimum mean square error filtering in restoring blurred images. | CO3 | E | 20 |
|  |  |  |  |  |  |
| 7. |  | Evaluate the accuracy of Haar cascades in detecting and recognizing faces under different lighting conditions. | CO4 | E | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Analyze the role of Non-Maximum Suppression (NMS) in improving the accuracy of object detection models. | CO5 | An | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Apply neural networks to enhance image recognition and classification in real-world applications. | CO6 | A | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Summarize the fundamental concepts of image processing. |
| CO2 | Utilize OpenCV for processing images. |
| CO3 | Apply image processing techniques in real life situations. |
| CO4 | Apply image search techniques using OpenCV. |
| CO5 | Demonstrate object detection and tracking techniques. |
| CO6 | Summarize the importance of neural networks and Augmented Reality in image processing. |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

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| **Course Code** | **23CA3044** | **Duration** | **3hrs** |
| **Course Title** | **MACHINE LEARNING OPERATIONS** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | Categorize the technical users of MLOps. | CO1 | An | 10 |
|  | b. | Explain the essential features of MLOps in AI model development. | CO1 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Analyze the key role of MLOps and its challenges in advancing enterprise data science. | CO2 | An | 20 |
|  |  |  |  |  |  |
| 3. |  | Examine the essential components involved in building a Machine Learning model. | CO2 | A | 20 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Assess the criteria for evaluating and comparing the machine learning models. | CO2 | E | 10 |
|  | b. | Identify the potential risks involved in deploying ML models. | CO3 | U | 10 |
|  |  |  |  |  |  |
| 5. | a. | Illustrate a CI/CD pipeline for ML artifact deployment. | CO4 | A | 10 |
|  | b. | Describe the concepts of various types of model deployment. | CO4 | R | 10 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Evaluate the MI model through a continuous ‘Monitoring and Feedback’ loop. | CO4 | E | 20 |
|  |  |  |  |  |  |
| 7. |  | Create a detailed analysis of template used in the governance of MLOps. | CO5 | C | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Justify the key elements that are required for a responsible AI. | CO5 | E | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. |  | Simulate the credit risk management for the customer using MLOps. | CO6 | A | 20 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

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|  | **COURSE OUTCOMES** |
| CO1 | Interpret the MLOps and the role of ML experts. |
| CO2 | Identify and mitigate common challenges when training, evaluating and deploying ML models. |
| CO3 | Discover the risks associated with ML model and provide security solutions. |
| CO4 | Devise strategies for deployment and monitoring of ML models. |
| CO5 | Choose the right model type for specific problems. |
| CO6 | Deploy scalable ML systems that you can retrain and update to reflect new data. |

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**END SEMESTER EXAMINATION – NOV / DEC 2024**

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| **Course Code** | **23CA3046** | **Duration** | **3hrs** |
| **Course Title** | **DEEP LEARNING TECHNIQUES** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. |  | Classify various activation functions and assess their strengths and limitations in machine learning applications. | CO1 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 2. |  | Develop a Python-based solution using linear regression for a real-world application, such as house price prediction or sales forecasting. | CO1 | C | 20 |
|  |  |  |  |  |  |
| 3. |  | Illustrate the significance of convolutional neural networks in OpenCV applications and evaluate the effectiveness of its architectural components in image processing applications. | CO2 | E | 20 |
|  |  | **(OR)** |  |  |  |
| 4. |  | Explain the different types of convolution operations and their applications in detail. | CO2 | U | 20 |
|  |  |  |  |  |  |
| 5. |  | Categorize the different types of Generative Adversarial Networks (GANs) and identify suitable applications for each type, highlighting the strengths and limitations of each category. | CO3 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 6. |  | Illustrate the role of different types of Word Embedding models in Natural Language Processing with suitable examples. | CO3 | A | 20 |
|  |  |  |  |  |  |
| 7. |  | Categorize the types of RNN topologies and identify the applications that suit each topology. | CO4 | An | 20 |
|  |  | **(OR)** |  |  |  |
| 8. |  | Explain the concept of Autoencoders and their applications in detail. | CO4 | U | 20 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | Explain the concept of reinforcement learning and analyze how it differs from other machine learning techniques. | CO5 | An | 10 |
|  | b. | Examine how reinforcement learning enhances decision-making in self-driving cars and evaluate its role in improving real-time navigation and safety. | CO6 | E | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
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|  | **COURSE OUTCOMES** |
| CO1 | summarize the fundamental concepts of neural networks. |
| CO2 | illustrate the concepts of convolutional neural networks. |
| CO3 | create generative adversarial networks. |
| CO4 | apply recurrent neural networks for solving applications. |
| CO5 | demonstrate the applications of reinforcement learning. |
| CO6 | application of deep learning in cloud and mobile applications |

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**END SEMESTER EXAMINATION – MAY/JUNE 2025**

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| **Course Code** | **23LN2002** | **Duration** | **3hrs** |
| **Course Name** | **FRENCH - II** | **Max. Marks** | **100** |

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| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | **Conjuguez les verbes au futur :** 1.envoyer 2. Pouvoir 3. finir | CO2 | R | 15 |
|  | b. | Qu’est ce que tu prends Pour le petit déjeuner ? | CO1 | U | 2 |
|  | c. | Écrivez en anglais  Bruit , pourvoir , vouloir | CO5 | U | 3 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | **Mettez les verbes suivants au présent de l’indicatif**  1. Ils \_\_\_\_\_\_\_\_\_(aimer) boire du vin.  2. Vous \_\_\_\_\_\_\_\_\_(manger) peu  3. Les touristes étrangers \_\_\_\_\_\_\_\_\_\_(préférer) des plats nos épicés.  4. Les touristes \_\_\_\_\_\_\_\_\_(prendre) le repas  5. Nous \_\_\_\_\_\_\_\_\_\_\_(choisir) un thali.  6.Tu \_\_\_\_\_\_\_\_\_\_(descendre)et \_\_\_\_\_\_\_\_(regler) la note. | CO3 | R | 7 |
|  | b. | **Mettez les verbes au futur :**  1.Nous \_\_\_\_\_\_\_\_\_(aller) a la plage ce soir.  2. J’\_\_\_\_\_\_\_(acheter) des souvenirs pour mes parents  3. Les touristes\_\_\_\_\_\_ (partir) pour Paris  4. On \_\_\_\_\_\_\_(rencontrer) des touristes français  5.Vous \_\_\_\_\_\_\_\_\_(prendre) des photos. | CO2 | R | 5 |
|  | c. | **Tous (toutes) ou quelques?**  a) J’ai visité \_\_\_\_\_\_\_\_\_\_monuments  b) Nous avons \_\_\_\_\_\_les renseignements nécessaire  c) \_\_\_\_\_\_\_\_\_les rues ont animées  d) Elle a rencontré \_\_\_\_\_\_\_\_\_\_touristes français  e) \_\_\_\_\_\_\_\_\_\_\_\_\_\_les objets y sont chers. | CO4 | R | 5 |
|  | d. | a)Est-ce qu’il y a le Wi-Fi dans la chambre? | CO3 | R | 3 |
| 3. | a. | **Faites l’accord des adjectifs :**  1. C’est une boutique \_\_\_\_\_(intéressant) et mais \_\_\_\_\_\_\_\_\_  (cher /chere)  2.Ces temples sont \_\_\_\_\_\_\_\_\_(grand /grande)  3. C’est une \_\_\_\_\_\_église (beau /belle)  4. La plage est \_\_\_\_\_\_(petit)  5.Ils sont \_\_\_\_\_\_\_\_\_de partir (content) | CO3 | U | 6 |
|  | b. | **Choisissez (le long de – près de – a – en face de)**  **1**. Il y a un hôpital \_\_\_\_\_\_\_\_\_\_deux kilomètres d’ici.  2. Elle a acheté une écharpe en soie dans la boutique qui se trouve \_\_\_\_\_\_\_\_\_\_\_l’hôtel.  3. vous devez vous promener \_\_\_\_\_\_\_la plage.  4. J’ai aperçu un écureuil\_\_\_\_\_\_la fenetre de ma chambre | CO4 | U | 4 |
|  | c. | **Faites des phrases**:  1.il y a 2. Avoir 3. Réserver 4. Combien 4. Le petit déjeuner | CO3 | R | 5 |
|  | d. | **Completez avec les articles partitifs (du, de la, de l’,des)**  1.Je prends \_\_\_\_\_\_\_\_\_tandoori  2. Nous mangeons \_\_\_\_\_\_\_\_glace.  3. Elle donne \_\_\_\_\_\_\_\_poisson  4.Avez-vous \_\_\_\_\_\_\_\_argent  5. Voulez-vous \_\_\_\_\_\_\_\_salade**.** | CO3 | U | 5 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | Qu’est-ce que tu as fait ce matin? | CO1 | U | 1 |
|  | b. | **Reliez**  a) un plat - 1) anime  b) des souvenirs - 2) in oubliable  c) une chambre - 3) excellent  d) un restaurant - 4) chers  e) un séjour - 5) confortable | CO4 | U | 5 |
|  | c. | **Lisez le passage of répondez aux questions suivantes**  L’année dernière, j’ai visité Paris pour la première fois. Avant mon arrivée. J’ai retenu une chambre à un lit à l’hôtel du Palais Royal.  J’ai visite de belles Cathédrale. J’ai vu la tour Eiffel et les autres monuments. J’ai pris mes repas dans les restaurants français. La France est très célèbre pour ses vins et ses fromages. J’ai acheté beaucoup de sortes de fromages pour ma famille et une bouteille de jus frais pour  Mon père. Les gens parisiens sont très aimables et sympathiques. C’est une belle ville pleine de charme.  **1. Répondez aux questions suivantes.**  1. Pourquoi la France, est-elle célèbre ?  2. Décrivez Paris par une phrase complète  **Dites vrai ou faux**  1. Les gens parisiens sont antipathiques.  2. La France est célèbre pour ses fromages.  3. Paris est une ville morte.  **Trouvez dans le texte**.  1. Un autre mot pour « fameux » \_\_\_\_\_\_\_\_\_\_\_\_\_\_  2. Le contraire de « laide » \_\_\_\_\_\_\_\_\_ avant \_\_\_\_\_\_\_\_\_\_  Départ \_\_\_\_\_\_\_\_\_\_\_  3. Un mot pour « une pièce où l’on couche «  **Complétez avec un/des mots du texte.**  1. La semaine \_\_\_\_\_\_\_\_\_\_\_J’ai organisé une boum chez moi.  2. Combien de \_\_\_\_\_\_\_\_\_\_de desserts as-tu prépares ?  3. Nous avons nettoyé la maison \_\_\_\_\_\_\_\_\_\_le retour  de nos parents.  4. Donnez-moi une \_\_\_\_\_\_\_\_\_\_\_d’eau minérale. | CO6 | U | 14 |
|  |  |  |  |  |  |
| 5. | a. | **Mettez les phrases au présent progressif :**  1. Nous prenons notre diner dans un restaurant indien.  2. Le client paie au tour-opérateur.  3. Les touristes prennent des photos de Yamuna.  4. Le guide explique l’importance historique d’Agra.  5. L’agence de voyages prépare un itinéraire pour ses clients. | CO5 | U | 5 |
|  | b. | **Transformez les phrases comme dans l’exemple:**  Ex: Vous devez prendre un taxi. Il faut prendre un taxi  1. Tu dois acheter des souvenirs pour tes amis  2. Je dois envoyer un mèl immédiatement  3. Vous devez régler la note une heure avant votre départ  4. Vous devez rendre la clé de votre chambre avant de sortir. | CO3 | U | 5 |
|  | c. | **Mettez au passe compose**  1. Nous \_\_\_\_\_\_\_\_(visiter) a l’église  2. Elle \_\_\_\_\_\_\_(acheter) des souvenirs  3. J’\_\_\_\_\_\_\_\_\_\_(entendre)parler des plats indiens  4. Nous \_\_\_\_\_\_\_\_(finir) notre devoir.  5. Nous \_\_\_\_\_\_\_\_\_(prendre) une excellence décision. | CO3 | R | 5 |
|  | d. | **Mettez-les au futur proche**  1.Nous (donner) la recette de ce plat.  2.Vous (essayer) quelques plats indiens  3. Elle (prendre) thali du nord de l’inde  4. Je (connaitre) les plats français.  5. Ils (gouter) les plats épices**.** | CO2 | R | 5 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | **Écrivez un message** à votre ami pour inviter à votre anniversaire. | CO4 | R | 10 |
|  | b. | **Écrivez une rédaction**  Le Voyage | CO4 | R | 10 |
|  |  |  |  |  |  |
| 7. | a. | **Transforme les questions selon le modelé :**  **Ex : Vous prenez cette table ? Est-ce que vous prenez cette table?**  a) Vous voulez un plat léger?  b) Vous voulez une bouteille d’eau minérale?  c)Vous prenez la formule un buffet?  d) Vous souhaitez avoir un café?  e) Vous payez maintenant? | CO3 | R | 5 |
|  | b. | **Conjugaison au présent** : Comprendre, refaire, partir | CO3 | R | 15 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | **Mettez les verbes au passé récent**  Ex. Je règle ma note - Je viens de régler ma note  1. Nous partons pour Madurai.  2. Ils prennent le diner.  3. Vous montrez la note.  4. Il appelle un taxi.  5. Tu arrives a l’aeroport | CO3 | R | 5 |
|  | b. | **Chassez l’intrus (odd one out)**  1.Brochure - dépliant – affiche - cheque  2. hotel - bureau - auberge - pension  3. la chambre – le lit – la voiture – le poste de télé  4. le professeur – la réceptionniste – le serveur – le garçon  5. visite - excursion – repas – pèlerinage. | CO4 | U | 5 |
|  | c. | **Traduisez en anglais**  Maitre d’hôtel :Bonjour mesdames, Bonjour Messieurs !  Client : Nous avons réservé une table pour six   personnes  Maitre d’hôtel : Oui, Par ici, s’il vous plait.  Client : Parfait. Et alors…Qu’est ce qu’on choisit ?  Maitre d’hôtel : Nous avons un excellent choix.   Biriyani, poisson, chicken chettinad,   chicken tandoori, un thali végétarien, etc.  Cliente : Alors pour moi, tandoori chicken.  Client : Monsieur qu’est ce qu’il y a dans un thali ?  Maitre d’hôtel : Dans un thali, vous avez des chapatis, du   riz, des subzis, des dessert et de la glace.  Client : C’est épice ?  Maitre d’hôtel : Pas trop épice. Comme boissons ?  Client : Nous prenons toujours de l’eau minérale. | CO2 | U | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | **Lisez le passage et répondez à des questions suivantes :**  La France est souvent appelée l’Hexagone, tout simplement parce que, sur la carte de France métropolitaine, on obtient un hexagone, une forme géométrique à six côtés. France a une superficie de 675417 km² (avec l’Outre-mer), s’étend sur 1000 km du nord au sud. C’est le troisième plus grand pays d’Europe, après la Russie et l’Ukraine. Les fleuves (les rivières) importants sont la Loire (1012 km), la Seine, la Garonne, le Rhône et le Rhin. Le plus haut sommet d’Europe s’y trouve en France est le Mont-blanc (4807 mètres).  La France est divisée en 13 régions en France métropolitaine et 5 régions d’outre-mer. Les cinq régions d’outre-mer sont la Guadeloupe, la Guyane, la Martinique, la Réunion et la Mayotte. L’île de Mayotte, proche de la côté sud-est de l’Afrique, près de la Réunion, est devenue officiellement les 96 départements français et le cinquième outre-mer.  Répondez :  1. La France est divisée en combien de régions?  2. Quelles sont les régions d’outre-mer de France?  3. Pourquoi s’appelle-t-on la France l’Hexagone?  4. Quel est le plus haut sommet d’Europe?  5. Quelle est la superficie de France?  6. Combien de départements y a-t-il en France | CO6 | U | 12 |
|  | b. | **Traduisez en anglais**  Serveuse : Bonjour, Monsieur! Vous êtes combien?  Client : Nous sommes deux  Serveuse : Par ici, s’il vous plait. Cette table au centre?  Client : Euh…. Nous préférons la table près de la fenêtre  Serveuse : Oui, bien sur. Un petit déjeuner continental ou un   petit déjeuner régional;?  Client : Régional?  Seveuse : Oui, le petit déjeuner de la région avec des spécialités   comme idli, dosa vadai, pongal etc. Alors, vous   prenez le petiti dejeuner régional?  Client : Oui, avec plaisir! | CO6 | U | 8 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | Become familiar with the basics of the language |
| CO2 | Introduce himself /herself and others and can ask the question and answer about personal details To ensure that the students have a glimpse of the French culture, tradition and literature. |
| CO3 | Construct the simple sentences in French using accurate rudiments of syntax and grammar |
| CO4 | Write short paragraph on simple topics (daily routine, shopping, describing, vacation etc.) |
| CO5 | Interact in a simple way provided the other person talks slowly and clearly and is prepared to help |
| CO6 | Learn the various strategies to overcome the basic difficulties in LSRW |

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**END SEMESTER EXAMINATION – MAY / JUNE 2025**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **23LN2004** | **Duration** | **3hrs** |
| **Course Title** | **தமிழ் - 2** | **Max. Marks** | **100** |

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| --- | --- | --- | --- | --- | --- |
| **Q. No.** | **Questions** | | **CO** | **BL** | **M** |
| **PART – A (4 X 20 = 80 MARKS)**  **(Answer all the Questions)** | | | | | |
| 1. | a. | கரகாட்டம் என்றால் என்ன?கரகம் அமைக்கப்படும் முறை பற்றி எழுதுக. | CO3 | U | 10 |
|  | b. | 1. ஒயிலாட்டம் என்றால் என்ன? 2. நான்கு நாள் திருவிழாக்களின் பெயர்களை விளக்கங்களுடன் கூறுக. | CO3  CO3 | R  U | 5  5 |
|  |  | **(OR)** |  |  |  |
| 2. | a. | புதுக்கவிதை எழுத்தாளர்கள் பற்றி விவரி. | CO6 | U | 10 |
|  | b. | பாரதிதாசன் வழி நின்று தமிழின் இனிமை பற்றித் தொகுத்து எழுதுக. | CO2 | U | 10 |
|  |  |  |  |  |  |
| 3. | a. | சிலம்பாட்டம் என்றால் என்ன? விளக்குக. | CO3 | An | 10 |
|  | b. | வல்லெழுத்துகள் மிகும் இடங்களை உதாரணங்களுடன் தொகுத்து எழுதுக. | CO5 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 4. | a. | 1. கபிலர் – ஆசிரியர் குறிப்புத் தருக.  2. பாரதிதாசன் – ஆசிரியர் குறிப்பு வரைக. | CO3  CO2 | R  R | 5  5 |
|  | b. | பாரம்பரிய சிறுதானிய உணவு வகைகளை விவரி. | CO3 | R | 10 |
|  |  |  |  |  |  |
| 5. | a. | புதுக்கவிதையின் தோற்றம் வளர்ச்சி பற்றி கட்டுரை வரைக. | CO6 | R | 10 |
|  | b. | பழந்தமிழரின் உணவு உட்கொள்ளும் 12 வகைகளை விளக்குக. | CO4 | U | 10 |
|  |  | **(OR)** |  |  |  |
| 6. | a. | தமிழில் கிறிஸ்தவ இலக்கியங்கள் – கட்டுரை வரைக. | CO1 | An | 10 |
|  | b. | எவையேனும் இரண்டு அணிகளை எடுத்துக்காட்டு தந்து விளக்குக | CO5 | A | 10 |
|  |  |  |  |  |  |
| 7. | a. | ஓடு ஓடு சங்கிலி கவிதையின் சாரத்தை கட்டுரை வரைக. | CO4 | R | 10 |
|  | b. | அறத்தொடு நிற்றல் என்றால் என்ன? விளக்குக. | CO3 | An | 10 |
|  |  | **(OR)** |  |  |  |
| 8. | a. | கிறிஸ்தவ இலக்கியம் என்றால் எப்படி இருக்க வேண்டும் என்பதன் வரையறையை விளக்குக. | CO1 | R | 10 |
|  | b. | புறப்பொருளின் இலக்கணம் மற்றும் அதன் வகைகளையும் விவரி. | CO5 | U | 10 |
| **COMPULSORY QUESTION** | | | | | |
| 9. | a. | 1.பொருத்துக   |  |  |  | | --- | --- | --- | |  | அங்கு, இங்கு பின் | தங்க மாங்கனி 108 | |  | விகடகவி | திருவிதாங்கோடு | |  | கிறிஸ்தவ தேவாலயம் | தெனாலிராமன் | |  | சூடுபட்ட புரோகிதர்கள் | சிற்பி | |  | எ + புத்தகம் | அதிசயக்குதிரை | |  | குதிரைப் படைத்தலைவன் | எப்புத்தகம் | |  | ஓடு ஓடு சங்கிலி | வல்லினம் மிகும் |  1. பாரதிதாசன் படைப்புகளில் ஐந்தனைக் கூறுக. | CO6  CO3 | R  R | 7  3 |
|  | b. | தெனாலிராமன் குறிப்பு மற்றும் ஏதாவது ஒரு கதையை விளக்கி அதன் கருத்தாக்கத்தை விவரி. | CO3 | A | 10 |

**CO** – COURSE OUTCOME **BL** – BLOOM’S LEVEL **M** – MARKS ALLOTTED

|  |  |
| --- | --- |
|  | **COURSE OUTCOMES** |
| CO1 | கிறித்தவ இலக்கியம் பற்றியும், கிறித்தவ தமிழ்த் தொண்டர்களின் படைப்பாற்றல் பற்றி அறிதல். |
| CO2 | இருபதாம் நூற்றாண்டு படைப்பாளர்களின் புதுக்கவிதை நிலைப்பாடுகள், கற்பனை, உத்தி,  சமூகச்சிந்தனைகள், தீர்வுகள் போன்றவற்றை எடுத்து இயம்புதல். |
| CO3 | தமிழ்க் காப்பியங்களையும், இலக்கியங்களையும் அறியத் தூண்டுதல். |
| CO4 | இலக்கிய வரலாற்றையும், இக்கால இலக்கிய வகைமைகளையும் அறிதல். |
| CO5 | தமிழ் மொழியை இலக்கணத்தின் வாயிலாக பிழையின்றி அறிய துணை செய்தல் |
| CO6 | தற்காலப் படைப்பாளர்கள் மற்றும் படைப்பிலக்கியத்தை அறியும் திறனடைதல். |