

**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS1001 Fundamentals of Computing and Programming**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

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- |    |  |            |
|----|--|------------|
| 1. | a. With a neat diagram explain the basic computer organization.                  | (10 marks) |
|    | b. List and explain different types of constants in C.                           | (10 marks) |
|    | <b>OR</b>  |            |
| 2. | a. Explain the characteristics of computers.                                     | (10 marks) |
|    | b. Determine the hexadecimal equivalent of $(4089)_{10}$                         | (3 marks)  |
|    | c. Determine the binary equivalent of $(231)_8$                                  | (3 marks)  |
|    | d. List the rules for declaring a variable.                                      | (4 marks)  |
|    |  |            |
| 3. | a. Write a program to find the sum of the digits of a number.                    | (5 marks)  |
|    | b. Explain the type of operators in C.   | (15 marks) |
|    | <b>OR</b>  |            |
| 4. | a. Write a program to swap two numbers using pointers.                           | (10 marks) |
|    | b. Write short notes of program control structures.                              | (5 marks)  |
|    | c. Explain about goto statement in C.  | (5 marks)  |
|    |  |            |
| 5. | a. Write a program to perform basic arithmetic operations using switch ... case. | (5 marks)  |
|    | b. Explain about loop control statements with example.                           | (8 marks)  |
|    | c. Differentiate break and continue with suitable example.                       | (7 marks)  |
|    | <b>OR</b>  |            |
| 6. | a. Explain the four types of functions with examples.                            | (12 marks) |
|    | b. Write a program to generate Fibonacci series of n terms.                      | (6 marks)  |
|    | c. Write a program to check whether the given number is odd or even in C.        | (2 marks)  |
|    |  |            |
| 7. | a. Compare the storage class specifiers with suitable example.                   | (10 marks) |
|    | b. Write a program to sort n numbers in ascending order.                         | (10 marks) |
|    | <b>OR</b>  |            |
| 8. | a. Identify and explain the functions used to perform string manipulation        | (12 marks) |
|    | i. To find the Length of the string      ii. To concatenate two strings          |            |
|    | iii. To copy a string                      iv. To compare two strings            |            |
|    | b. Write short notes on enumerated data type.                                    | (8 marks)  |
|    |  |            |
| 9. | a. Describe about structure in C.  | (10 marks) |

b. List and explain the steps involved in software development

(10 marks)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2001 Analysis of Algorithms**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. A) Describe the asymptotic notations Big-Oh, Big-Omega and Big-Theta with appropriate examples. Represent the following functions in Big-Theta notation: (10)

$$\rightarrow 6n^2 + 8n$$

$$\rightarrow 3n^2 \log n$$

$$\rightarrow 2n^2 3^n + n \log n$$

$$\rightarrow n^2 + \log n$$

B) Write down the general plan for analyzing time efficiency of Nonrecursive algorithm. Apply the plan to analyze the time efficiency of the Nonrecursive solution to element uniqueness problem. (10)

**OR**

2. A) Discuss the various methods for calculating greatest common divisor of two nonnegative integers and conclude the best one. (10)

B) Analyze the time efficiency of the recursive solution to Tower of Hanoi problem. (10)

3. A) Write the bubble sort algorithm. Apply it to sort the list of characters A, L, G, O, R, I, T, H, M. Analyze the algorithm's efficiency. (10)

B) Write a Brute-force solution for finding a substring of a text of n characters that matches the given pattern of m characters ( $m \leq n$ ). Do the analysis of the algorithm. (10)

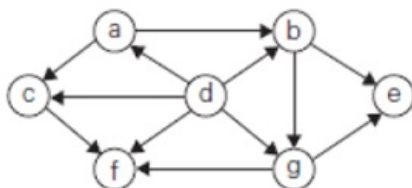
**OR**

4. A) What is computed by the following algorithm? Compute the number of times the addition is done in the algorithm. (6)

```
ALGORITHM What(T){  
    //Input: A binary tree T  
    //Output: ?  
    if (T=NULL) return -1;  
    else return max {What(T->left), What(T->right)} + 1;  
}
```

B) Write down the pseudo code for sorting the given array of n numbers using the merge sort algorithm and analyze the efficiency. Apply the algorithm to sort the list of numbers 40, 20, 70, 10, 50, 100, 80, 60. (14)

5. A) Solve the topological sorting problem for the following digraph using DFS method with explanation. (10)



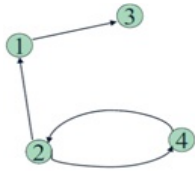
B) Write down the pseudo code of the breadth-first search traversal of a given graph. What will be the efficiency of the code for the different representations of the graph? (10)

**OR**

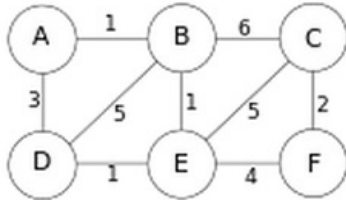
6. A) Construct a 2-3 tree for the list of numbers: 30, 60, 50, 10, 20, 40, 18, 90, 25, 70. What is the time efficiency of searching in 2-3 tree? (8)
- B) Write the bottom-up construction of heap algorithm with the worst-case analysis. Construct a heap for the list 1, 8, 6, 5, 3, 7, 4, 10, 9, 2. (12)
7. A) Demonstrate how the list 60, 30, 80, 90, 10, 40 is sorted using comparison counting sort. Compute the number of comparisons done. (8)
- B) Write Boyers-Moore algorithm for string matching. Apply the algorithm to search for the pattern AT\_THAT in the text WHICH\_FINALY\_HALTS.\_.AT\_THAT by constructing bad-symbol table and good-suffix table. (12)

**OR**

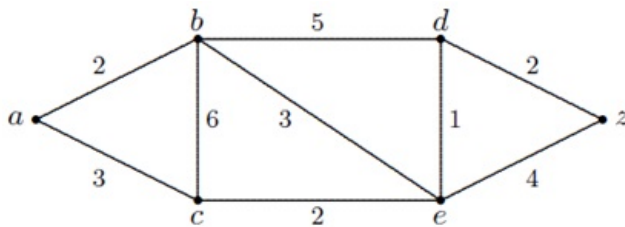
8. A) Find the transitive closure of the following digraph by applying Warshall's algorithm: (10)



- B) Apply Dijkstra's algorithm to find the shortest path from vertex A to all the other vertices: (10)



9. A) Explain how dynamic programming technique is used for calculating binomial coefficient. Discuss the algorithm with the time complexity. (8)
- B) Apply Prim's algorithm in the following graph to construct minimum spanning tree. Write the time complexity of the algorithm for the representations adjacency matrix and adjacency list. (8)



- C) Write a note on P and NP problems with examples. (4)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2005 Computer Architecture**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

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1. (i) Explain the SRAM and DRAM architecture with a suitable circuit diagrams and compare their features. (15)
- (ii) Discuss the Rambus DRAM technique with a neat diagram. (5)
- OR**
2. (i) Compare and contrast associative and set associative mapping techniques used in cache memory with suitable diagrams. (15)
- (ii) Discuss the cache replacement policies with examples. (5)
3. Suppose an 8-bit data word stored in memory is 11000010, Using the Hamming algorithm. Determine what check bits would be stored in memory along with the data word. How the error will be detected, if the word is read out as 10000010. (20)
- OR**
4. (i) Explain the programmed and interrupt driven I/O techniques with a neat sketch. (15)
- (ii) Compare the sign magnitude and two's complement representation of numbers. (5)
5. Explain the two's complement division algorithm with suitable flowchart and evaluate the same with 7/3. (20)
- OR**
6. (i) Explain the zero address, one address, two address and three address instruction formats with suitable examples. (5)
- (ii) An address field in an instruction contains decimal value 14. Where is the corresponding operand located for (15)
- a. immediate addressing?
- b. direct addressing?
- c. indirect addressing?
- d. register addressing?
- e. register indirect addressing?
7. (i) Explain how the performance of instruction execution is improved in instruction pipelining architecture over sequential execution with neat sketch. (15)
- (ii) Draw the instruction cycle state diagram with interrupt cycle. (5)
- OR**
8. Compare and contrast hardwired implementation and a micro programmed implementation of a control unit? (20)
9. (i) Discuss the various types of data hazards and their solutions with examples. (10)

(ii) Explain the branch penalty in instruction pipeline with suitable examples.

(10)

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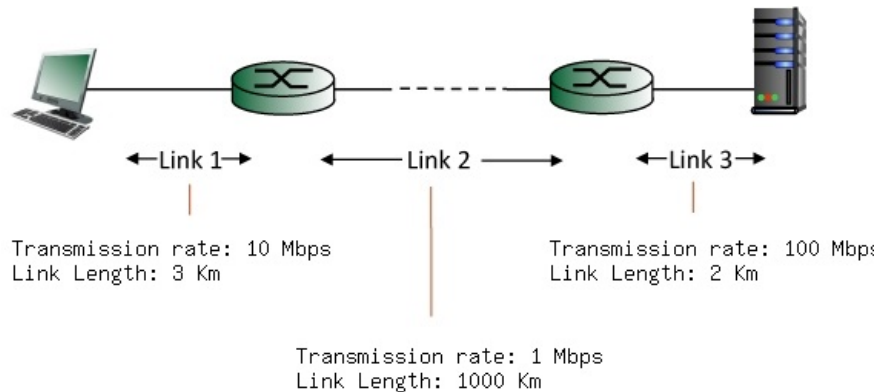
**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2007 Computer Networks**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Consider the figure below, with three links, each with the specified transmission rate and link length. (8)



Find the end-to-end delay from when the left host begins transmitting the first bit of a packet to the time when the last bit of that packet is received at the server at the right. The speed of light propagation delay on each link is  $3 \times 10^8$  m/sec. Note that the transmission rates are in Mbps and the link distances are in Km. Assume a packet length of 12000 bits. Give your answer in milliseconds.

- b. Explain the functions of TCP/IP protocol layers with necessary figures (12)

**OR**

2. Explain the concept of Network core giving importance on the packet switched network.
3. Explain about the HTTP and also stress on the concept of cookies.

**OR**

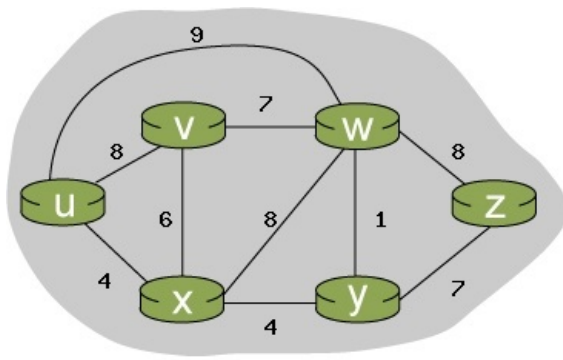
4. Write a detail note on DNS working along with its resource record and message format.
5. a. Illustrate TCP segment structure and also focus on the TCP's connection management and flow control. (14)
- b. Stress on the concept of Connection-oriented Multiplexing and De-Multiplexing. (6)

**OR**

6. a. Illustrate the principles of congestion control for three different scenarios and justify the throughput and delay experienced under each condition. (14)
- b. Illustrate UDP segment structure and calculate the internet checksum for any sample data of your choice. (6)
7. Compare and contrast on the following
- a. Datagram format of IPV4 and IPV6 (7)
- b. Multiple access protocol CSMA with ALOHA. (7)
- c. Virtual circuit and Datagram Network. (6)

**OR**

8. a. Narrate the components of a router. (8)
- b. Consider the 6-node network shown below, with the given link costs (12)



Using Dijkstra's algorithm, find the least cost path from source node **u** to all other destinations. Show your work in tabular format

9. Explain Ethernet frame structure along with the MAC protocol and calculate its efficiency.

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**14CS2009 Data Structures**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

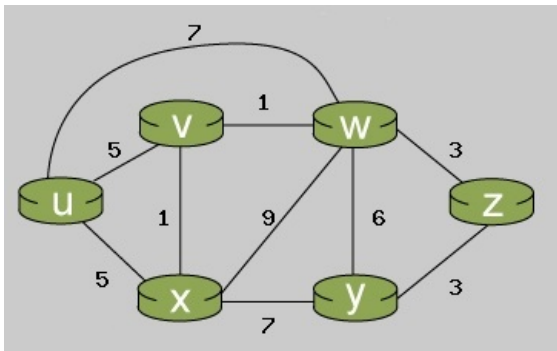
1. What is a Binary Search Tree (BST)? Build a BST for the following sequence of numbers. 45, 36, 76, 23, 89, 115, 98, 39, 41, 56, 69, 48. Give the Preorder, Inorder and Postorder traversals of the tree. (20)

**OR**
2. What is an AVL tree? Define balance factor of an AVL tree. Discuss about the four rotation types in AVL tree with examples. Construct an AVL tree for the list 1, 2, 3, 4, 5, 6, 7, 8, 9. (20)
3. a) Write an algorithm for Quick Sort and explain with the input 42, 23, 74, 11, 65, 58, 94, 36, 99, 87. (10)  
b) With an example, explain linear and binary search algorithms. (10)

**OR**
4. a) What is hashing? Discuss any two collision resolution techniques in hashing. (10)  
b) Sort the following sequence of keys using merge sort. (10)  
66, 77, 11, 88, 99, 22, 33, 44, 55
5. Write an algorithm to find solution for the Towers of Hanoi problem. Explain the working of your algorithm with 4 disks using diagrams. (20)

**OR**
6. Explain Queue ADT. (20)
7. a) Convert the following infix expressions into its equivalent postfix expressions: (10)  
i)  $(A + B - D) / (E - F) + G$       ii)  $A * (B + D) / E - F * (G + H - K)$   
b) Explain the algorithms for insertion and deletion in a singly linked list with an example. (10)

**OR**
8. a) Formulate an algorithm to find the factorial of a number recursively. Illustrate the use of stack for it with an example. (10)  
b) Explain the address calculation of arrays using row major and column major order. (10)
9. a) Name two ways of representing graph data structure in a computer program. (1)  
b) What are the different graph traversal methods? (1)  
c) Define Minimum Spanning Tree. (2)  
d) List out the applications of Priority Queue. (2)  
e) Illustrate Dijkstra's algorithm for finding the shortest path from vertex u to all other vertices in the following graph. (14)



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**End Semester Examinations - Nov-Dec 2015 Exams**

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**14CS2011 Database Systems**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

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1. Draw a data model to design and develop a biological database using entity relationship model. (20)
  - OR**
  2. Define an example on your own and describe how data definition language elements used to manipulate database schemas. Each example should contain syntax, query and purpose of query. (20)
  3. A. Write query and show examples how set operations done on two or more table to combine similar type of data and how pattern matching done using like operator. (15)  
B. Write a short note on SQL arithmetic operators. (5)
  - OR**
  4. What is a join? Explain different types of join and effect of join concept in generating a report with suitable examples. (20)
  5. Define normalization. Explain how to overcome data anomalies and develop a organized database using normalization techniques. (20)
  - OR**
  6. A. Illustrate and explain the decomposition of tables in third normal with a suitable example. (15)  
B. Write a short note on domain key normal form. (5)
  7. A. Describe and illustrate the steps involved in query processing. (10)  
B. Discuss the features of concurrency control and recovery operations in oracle.(10)
  - OR**
  8. Write in detail about different SQL date and time zone functions with examples. (20)
  9. What is the use of view in database system? Explain the effect of view feature with example containing atleast three tables. (20)
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**14CS2015 E-Commerce**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

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1. Discuss the various types of E-Commerce from the perspective of the buyer and seller relationship with proper example.
  - OR**
  2. Elucidate the Internet model with necessary diagrams.
  3. A departmental store has a relational database system. How can they influence the data and make maximum use of it?
  - OR**
  4. Explain HTML Forms and Frames with example HTML code.
  5. Explain the steps followed in RSA key encryption and decryption with an example. Given  $p=19$ ,  $q=7$  and  $M=29$ .
  - OR**
  6. What is the use of firewall in a network? Discuss the different types of it.
  7. Discuss the models of E-retailing.
  - OR**
  8. Explain the various types of business models in E-commerce.
  9. Consider you are owning a Company and you want to promote your company through internet. Discuss the techniques and strategies you will follow to promote it via internet

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2018 Ethics in Information Technology**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

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1.
    - i. Explain the reasons for promoting a work environment in which employees are encouraged to act ethically at the time of decision making. (10)
    - ii. Discuss the process of decision making and point out the areas where ethical considerations have to be considered. (10)
  - OR**
  2. Explain the common ethical issues for the IT users. What are the several actions taken while creating an IT usage policy? (20)
  3. Define zero-day attack. Explain the various types of computer exploits. (20)
  - OR**
  4.
    - i. Explain the various key issues related to freedom of expression. (10)
    - ii. Suppose that you are the computer technical resource for country's public library system. The library is making plans to install internet filtering software so that it will conform to Children's Internet Protection Act and be eligible for federal funding. What sort of objectives can you expect regarding implementation of internet filters? How might you deal with such objectives? (10)
  5. Explain the various issues that will apply to intellectual property and information technology. (20)
  - OR**
  6.
    - i. Explain the process of software development in detail. What are different types of testing that will be done to ensure the quality of the software? (10)
    - ii. Your company is considering using N-version programming with two software development firms and two hardware devices for the navigation system of a guided missile. Describe the scenario, and outline the several advantages and disadvantages of this approach. (10)
  7. Describe the impact of IT on healthcare solutions. How are mobiles and wireless technology used in healthcare industry? (20)
  - OR**
  8.
    - i. What are the various offences in cyber crime and explain the laws in IT Act, 2000? (10)
    - ii. Outline the legislative acts in various areas that affect the privacy of the people. (10)
  9. What is a social networking website? Discuss on the various ethical issues that arises for the members of the social networking web sites. (20)
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**End Semester Examinations - Nov-Dec 2015 Exams**

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**14CS2021 Information Security**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

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1.           a. Explain the various groups of threats faced by an computer based organization. (10)  
              b. Discuss the software vulnerabilities with suitable examples. (10)
  - OR**
  2.           a. What are substitution ciphers? Illustrate the encryption and cryptanalysis of ceaser cipher with an example. (12)  
              b. Write a detailed note on Rijndael Algorithm. (8)
  3.           a. Discuss the RSA algorithm and demonstrate the encryption and decryption for plaintext M=88. (12)  
              b. Encrypt the following message using vernam cipher. (8)  
                                  "THE TRUE COMPUTER HACKERS FOLLOW A CERTAIN SET OF ETHICS"
  - OR**
  4.           a. List and explain the common sources of non-malicious program errors. (10)  
              b. Write a detailed case study on Trapdoor and Brain Virus. (10)
  5.           a. Explain the security methods and levels of protection in operating system. (10)  
              b. Discuss about user authentication in detail. (10)
  - OR**
  6.           a. Illustrate the various access control mechanisms in operating system. (12)  
              b. Explain the file protection mechanisms. (8)
  7.           a. Write a detailed note on security requirements in databases. (10)  
              b. Discuss about the various protection schemes for memory and memory address. (10)
  - OR**
  8.           a. How does reliability and integrity is achieved in databases. (12)  
              b. List and describe the types of disclosures. (8)
  9.           a. What Makes a Network Vulnerable? Explain the possible threats in networks. (12)  
              b. Write a detailed case study on Firewalls. (8)
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**End Semester Examinations - Nov-Dec 2015 Exams**

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**14CS2030 Multimedia Systems and Design**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

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1. Draw the multimedia workstation Architecture and explain the application you would select for conducting an online review over the internet having facilities to have video teleconference, multimedia document access, view full-motion video, audio and video controls and remote desktop access. Substantiate your answer with suitable figures.

**OR**

2. For designing the Prospectus' 16, Karunya University has hired a photographer to take photographs as well as short videos of the entire facilities available in the campus. Due to the immense number of photographs and its size there is a need for data compression. List the various categories and types of compression and suggest which compression methodology would be the apt for storing the photographs and videos.
3. Write the various compression schemes associated with binary images with suitable examples. Compare and contrast lossless compression standards from lossy compression standards, listing the available compression mechanism in each standards.

**OR**

4. What are the various requirements addressed by JPEG? Write about the JPEG standard components.
5. a). Draw the format for CCITT group 4 2D compressions and explain the compression methodology. (8)  
b). Write the conversion scheme for converting from YUV model to the RGB model and the conversion scheme for converting from RGB color model to YUV model. (7)  
c). What are the most commonly used Color Models available to represent color mathematically? (5)

**OR**

6. a) A 14 inch monitor has an active display area with a width of 9.875inch, a height of 12.5inch, and a diagonal of 12.25inch. For a resolution of 1024 x 768 pixels, calculate the Horizontal and Vertical dot pitch. (5)  
b) Compare the various printing technologies available currently and write the area in which it is being used. (15)

7. Write about MPEG Compression.

**OR**

8. The organization you are working at is in a dilemma in choosing between Block Interleaving RAID level and Sector Interleaving RAID level. Compare both the mentioned RAID levels and give your suggestion in selecting the best RAID level between the two for the organization.
9. With suitable figures, write the need for cache management in various storage systems.

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2035 Object Oriented Programming in C++**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Explain the basic object oriented programming concepts. (10)
- b. Write a C++ program to create a structure called coordinate with two members x,y with the data type double. Create two coordinates. Add them and store it into a third coordinate and print all the three coordinates. (10)

**OR**

2. a. An electricity board charges the following rates to domestic users to discourage consumption of energy. For the first 100 units – 60 Paise per unit. For next 200 units - 80 paise per unit. Beyond 300 units - 90 Paise per unit. All users are charged a minimum of Rs. 50.00. If the total amount is more than Rs. 300 then an additional surcharge of 15% is added. Write a program to get the names of the users and the number of units consumed by the user and display the electricity bill for the users. (10)
- b. Explain the arithmetic and relational operators with necessary examples. (10)
3. a. Explain the following with a suitable example
- Call by value
  - Call by reference
  - Function overloading ( use minimum 4 different functions ) (12)
- b. Write a C++ program to demonstrate default argument mechanism. (8)

**OR**

4. a. Create a class to represent an item in a super market with the following members
- Item code, Item Name, price, quantity, discount
- Define a parameterized constructor to initialize the members. Also define Member functions to read and print the data. (12)
- b. Explain the use of an inline function with an example program. (8)
5. a. Write a detailed description on the following (15)
- Simple Inheritance
  - Multiple Inheritance
  - Hierarchical Inheritance
  - Hybrid Inheritance
- b. Explain any five string functions from the string class with suitable example. (5)

**OR**

6. a. Explain binary operator overloading with a suitable example. (10)
- b. Write a function named "reverse" that takes as its arguments the following: (10)
- (1) an array of floating point values;
  - (2) an integer that tells how many floating point values are in the array.
- The function must reverse the order of the values in the array. Thus, for example, if the array that's passed to the function looks like this:

|     |     |     |     |     |
|-----|-----|-----|-----|-----|
| 0   | 1   | 2   | 3   | 4   |
| 5.8 | 2.6 | 9.0 | 3.4 | 7.1 |

- then the resultant array will be modified so that it looks like this:

| 0   | 1   | 2   | 3   | 4   |
|-----|-----|-----|-----|-----|
| 7.1 | 3.4 | 9.0 | 2.6 | 5.8 |

- The function should not return any value.

7.
  - a. Discuss about constant member function with an appropriate example. (8)
  - b. What is virtual function? Illustrate the use of virtual function concept with an appropriate example. (12)
- OR**
8.
  - a. Illustrate the use of friend class with an example program. (10)
  - b. What do you mean by a stream? Discuss the functions of the istream class with syntax and suitable example. (10)
9.
  - a. What is exception handling? Give the types and illustrate the use of exception handling types with appropriate examples. (10)
  - b. Implement the stack operation using template. (10)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2037 Operating System**

**Set  
A**

**Time : 3 hrs  
Total Marks: 100**

1. a. Describe the differences between symmetric and asymmetric multiprocessing. (4)
- b. What are the five major activities of an operating system with regard to file management? (10)
- c. Consider you are designing an operating system for new computing environment. Can Layered approach provide more advantages to operating system functions? Discuss your answer. (6)

**OR**

2. a. Consider the following set of processes, with CPU burst time:

| Sl. No | Process | Burst Time in Milliseconds | Priority |
|--------|---------|----------------------------|----------|
| 1      | P1      | 10                         | 3        |
| 2      | P2      | 1                          | 1        |
| 3      | P3      | 2                          | 3        |
| 4      | P4      | 1                          | 4        |
| 5      | P5      | 5                          | 2        |

Arrival Order: P1, P2, P3, P4, P5

- i. Draw Gant charts that illustrate the execution of these processes using following algorithms: FCFS, SJF and Non Preemptive priority scheduling. (10)
- ii. Calculate the Average waiting time and Individual process waiting time for each scheduling algorithm. (10)
3. a. Describe how the Swap( ) instruction can be used to provide mutual exclusion that satisfies the bounded-waiting requirement and explain counting semaphore with necessary diagram. (10)
- b. What is meaning of the term busy waiting? (4)
- c. Can busy waiting be avoided in an operating system? Discuss your answer. (6)

**OR**

4. a. The conventional paging hardware implementation requires two memory accesses to access the data in the physical location. Discuss the alternative hardware implementation to avoid two memory accesses in paging mechanism with necessary diagram. (12)
- b. Describe the benefits of a virtual memory system and explain the concept of demand paging. (8)
5. a. Following are the five memory partitions with 100KB, 500KB, 200KB, 300KB and 600 KB capacity. Processes are submitted in the following order. (P1)212KB →(P2) 417KB→(P3) 112KB →(P4) 426KB. Which algorithm makes the most efficient use of memory? First Fit algorithm (or) Best Fit algorithm (or) Worst F algorithm. (10)
- b. Explain the following terms with necessary examples.
- i) Shared Pages                      ii) Hierarchical Paging (10)

**OR**

6. a. Discuss the advantages and disadvantages of associating with remote file systems. (5)
- b. Explain the following terms:
- i. Mount Protocol
- ii. NFS Protocol (10)
- c. Draw the block diagram of File control block and briefly describe the parameters of an file control block. (5)

7. a. Consider the following Processes and resources in a system:

5 processes  $P_0$  through  $P_4$ ; 3 resource types :  $A$  (10 instances),  $B$  (5instances), and  $C$  (7 instances)

Snapshot at time  $T_0$ :

| Process | <u>Allocation</u> | <u>Max</u>  | <u>Available</u> |
|---------|-------------------|-------------|------------------|
|         | $A \ B \ C$       | $A \ B \ C$ | $A \ B \ C$      |
| $P_0$   | 0 1 0             | 7 5 3       | 3 3 2            |

|       |       |       |  |
|-------|-------|-------|--|
| $P_1$ | 2 0 0 | 3 2 2 |  |
| $P_2$ | 3 0 2 | 9 0 2 |  |
| $P_3$ | 2 1 1 | 2 2 2 |  |
| $P_4$ | 0 0 2 | 4 3 3 |  |

Answer the following questions using Banker's algorithm:

- Is the system in a safe state?
- What is the content of the Need matrix?
- Find the process sequence which satisfies the safety requirement. (15)

- b. Describe the differences between RAID Level 3 and RAID Level 5. (5)

**OR**

8. a. Consider the dining Philosophers problem. Five philosophers are in the dining table. Five plates and five chopsticks are placed in the dining table. Write an algorithm to achieve process synchronization between philosophers. Also explain the solution steps. (10)

- b. To develop a deadlock avoidance module for an operating system, describe the necessary deadlock characterization and explain the methods for deadlock avoidance. (10)

9. a. Consider a disk drive has 3,000 cylinders, numbered 0 to 2999. The drive is currently serving a request at cylinder 143 and the previous request was at the cylinder 125. The queue of pending requests, in FIFO order, is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 2400, 130. Starting from the Head position, what is the total distance (In cylinders) that the disk arm moves to satisfy all the pending requests for each of the following Disk scheduling algorithms?

- FIFO
- SSTF
- C-Scan (10)

- b. Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for the following replacement algorithms?

- Frame size = 3 Algorithm: FIFO and Optimal Page replacement. (5)
- Frame size = 4 Algorithm: Optimal Page replacement and LRU. (5)

Assume that all the frames are empty initially.

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2040 Programming in Java**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. A) Write a java program to find whether the given number is prime or not. (7)  
B) Discuss about Java's automatic type conversion & casting incompatible types. (7)  
C) List the features of Java. (6)

**OR**

2. A) List all the relational operators, bitwise operators and briefly write about each operators with example.(15)  
B) Differentiate break and continue with an appropriate example. (5)
3. A) Define an interface called "Shape" that contains a method called area().Write a java program to calculate the area of two shapes, Square and Rectangle by implementing the "Shape" interface.(10)  
B) Differentiate method overlaoding and method overriding with an appropriate example. (10)

**OR**

4. A) Consider the following java program called Addition.java that reads the input through command line arguments to sum the elements.

```
class Addition{  
  
public static void main(String arg[]){  
  
for(int i=0;i<arg.length;i++){  
  
int sum = sum + Integer.parseInt(arg[i]);  
  
double avg = sum / i;  
  
}  
  
}
```

While executing this program in the following way

```
java Addition 10 20 thirty 40 fifty 60 70
```

What kind of exceptions occurs? How will you handle these exceptions? Explain. (12)

- B) List the use of final keyword. Discuss with appropriate example. (8)
5. A) Write a java program on Producer Consumer problem and explain the concept of Inter Thread communication.(15)  
B) Discuss the use of ordinal() & compareTo() method of Enum class with an example.(5)

**OR**

6. A) Write in detail about synchronization with appropriate example. (10)  
B) How deadlock occurs in a multitasking program? Explain with an example. (10)

7. A) Write a java program to copy contents from one file to another file. (10)

B) Discuss about serialization with a suitable example. (10)

**OR**

8. A) Write a java program to create chat between client and server. (10)

B) Discuss in detail about the life cycle of an applet. (10)

9. A) Discuss about Border layout, Grid layout with example. (10)

B) Create a window based java program that allows you to enter the student's data – ID number, last name and first name. Include two buttons and instruct the user to click UG or PG after entering the data for each student. Depending on the user's choice, write the data to either a UG.txt file or PG.txt file. (10)

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**End Semester Examinations - Nov-Dec 2015 Exams**

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**14CS2042 Software Engineering**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

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1. a. Tamil Nadu Electricity Board (TNEB) would like to automate its billing process. Customers apply for a connection (domestic/commercial). EB staff takes readings and update the system. Each customer is required to pay charges bi-monthly according to the rates set of the type of connection. Customers can choose to pay either by cash/card. A bill is generated on payment. Monthly reports are provided to EB Manager. Draw the Level – 0 DFD for the mentioned scenario. (5)  
  
b. Draw the use case diagram and sequence diagram for buying a book of your choice from different categories of books in an online book store. (8+7)  

**OR**
2. Illustrate the functions of a requirement engineering process that transforms the customer needs into an operational system. (20)
3. Write notes on the important software design concepts that span both traditional and object-oriented software development.(20)  

**OR**
4. As a designer of traditional software, how will you derive a complete architectural style for the software to be developed? Examine each architectural design tasks in detail.(20)
5. a. A formal technical review is effective only if everyone has prepared in advance. What will be your role if you're the review leader? Discuss in detail.(10)  
  
b. As test-case designer, how will you derive a cyclomatic complexity measure of a procedural design and the test cases to execute every statement in the program using basis path testing? Explain with an example. (10)  

**OR**
6. A typical software project consists of multiple software modules that are logically related with each other and coded by different programmers. Explain the conventional testing approaches that are used to test the data communication amongst these modules with neat diagrams. (20)
7. Explain the following software configuration management techniques:  
  
a. SCM Repository.(10)  
  
b. SCM Elements, (10)  

**OR**
8. As a project manager, your objective is to define all project tasks, identify the tasks that are critical and then track their progress. What are the basic principles you need to apply in software project scheduling and show the relationship between the effort applied and delivery time for a software project using PNR curve.(20)
9. a. You have been appointed as a project manager for a major software products company. Your job is to manage the next generation version of widely used word-processing software. Because competition is intense, tight deadlines have been established and announced. What software process model would you choose? Justify your answers with neat diagram.(10)  
  
b. Explain the key activities of Extreme Programming with neat diagram.(10)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2044 Introduction to System Administration**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. a) List any five shells available in Linux and describe them. (10)  
b) Write the shell start-up process. (5)  
c) Explain the need of alias. Write the command to set alias ll for the command "ls -la".

**OR**

2. a) Write the commands to perform the following tasks in command line interface  
i) Find the current working directory (1)  
ii) Create a new file free-elective in the directory 'test'. (3)  
iii) Copy the "test" file to "hello", by making a second copy of the file in the same directory. (2)  
iv) Delete the file "test". (2)  
v) List the history and execute the second command listed once again without typing the command. (2)  
b) Write about the need of SHELL Variables and the various SHELL Variables available. (10)
3. a) You are been give the task of setting up a printer in the lab and the system is having Linux operating system installed. Write the process to be carried out and the commands that are used for documents to be printed. (5)  
b) Write about linux users and groups. Substantiate your answer with necessary commands to show the creation of accounts, configuration file and the parameters in the configuration file. (15)

**OR**

4. a) Give a description of file type and the symbol used in far left of ls -l output. (15)  
b) Write the commands to mount and un-mount a CD. How find command is used? (5)
5. Write the commands to perform the following operation:  
a) Create a new file 'personal details' (1)  
b) Insert your personal details – name, age, address, phone number, email. (5)  
c) Save and exit the file (1)  
d) Using grep search for the pattern name. (2)  
e) Copy the file and save as 'student-personal details' (2)  
f) Copy the five fields (2)  
g) Paste it two times (2)  
h) Find the pattern age in the file and replace it as DOB thought the file. (5)

**OR**

6. a) Write the contents displayed while executing the following commands: (10)  
i) ps,  
ii) ps aux,  
iii) ps aux | less,  
iv) ps axf,  
v) ps -user username.  
b) With necessary commands write how process is controlled? (10)
7. Using at and crontab how tasks are scheduled. Write with necessary examples and commands. (20)

**OR**

8. How remote login is performed? Explain the three principal methods. (20)
9. Write the technical parameters taken into consideration while procuring a new system for an organization. Explain the steps followed in installing Linux operating system in the newly procured system. (20)

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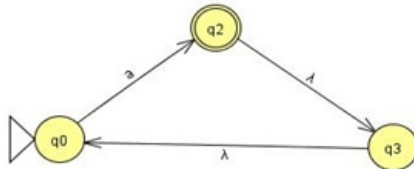
**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2047 Theory of Computation**

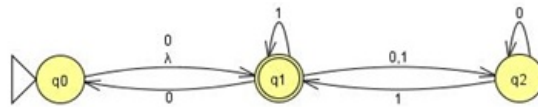
**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a) Find  $d^*(q_0, a)$  and  $d^*(q_0, aaa)$ . (5 marks)

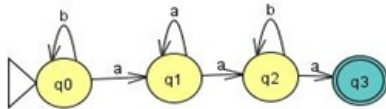


- b) Convert the following NFA into its equivalent DFA. (15 marks)



**OR**

2. a) Find  $L_1/L_2$  such that  $L_1 = L(a^*baa^*)$  and  $L_2 = (aba^*)$ . (8 marks)
- b) Find the regular expression for the language accepted by the finite automata. (12 marks)



3. a) With the assist of suitable transition diagram, differentiate DFA from NFA and briefly write about extended transition function of a DFA (8 Marks)

- b) Construct DFA for the string over  $\Sigma = \{a, b\}$  for  $(a+b)^*baab$ . (12 Marks)

**OR**

4. a) Construct an NFA accepting  $(ba \cup aab)^*$  and convert the resulting NFA to DFA. (12 Marks)

- b) Find an NFA with four states for  $L = \{b^n : n \geq 0\} \cup \{a^n b : n \geq 0\}$  (8 Marks)

5. a) Construct leftmost derivation, rightmost derivation and parse tree for the string “**a+b\*c**” using the grammar. (12 Marks)

$$E \rightarrow E + T \mid T$$

$$T \rightarrow T * F \mid F$$

$$F \rightarrow (E) \mid I$$

$$I \rightarrow a \mid b \mid c$$

- b) Find the s-grammar and left linear grammar for  $L = (ab^*(a+b))$  ( 8 Marks)

**OR**

6. a) Transform the following context free grammar in to Chomsky Normal Form. (10 Marks)



$S \rightarrow abAB$   
 $A \rightarrow bAB \mid \lambda$   
 $B \rightarrow BAa \mid A \mid \lambda$

b) Transform the following context free grammar in to Greibach Normal Form. (10 Marks)

$S \rightarrow AaBb$   
 $A \rightarrow abB \mid \lambda$   
 $B \rightarrow AB \mid A \mid \lambda$

7. a) What is the language accepted by the following NPDA? (4 marks)

$M = (\{q_0, q_1, q_2\}, \{a, b\}, \{a, b, z\}, \delta, q_0, z, \{q_2\})$  with transitions.

$\delta(q_0, a, z) = \{(q_1, a), (q_2, \lambda)\}$   
 $\delta(q_1, b, z) = \{(q_1, b)\}$   
 $\delta(q_1, b, b) = \{(q_1, b)\}$   
 $\delta(q_1, a, b) = \{(q_2, \lambda)\}$

b) Construct a pda that accepts the language generated by the grammar with productions  $S \rightarrow aSbb \mid a$  (6 Marks)

c) Is the language  $L = \{a^n b^n : n \geq 1\} \cup \{a\}$  deterministic? (10 Marks)

**OR**

8. a) Write the moves for the string “aabb” based on the transitions of the pushdown automata given below. (4 Marks)

$\delta(q_0, \lambda, z) = \{(q_1, Sz)\}$   
 $\delta(q_1, a, S) = \{(q_1, SA), (q_1, \lambda)\}$   
 $\delta(q_1, b, A) = \{(q_1, B)\}$   
 $\delta(q_1, b, B) = \{(q_1, \lambda)\}$   
 $\delta(q_1, \lambda, z) = \{(q_2, \lambda)\}$

b) Construct NPDA that accepts the following languages. (16 Marks)

$L_1 = \{w : n_a(w) = n_b(w) + 1\}$   
 $L_2 = \{wcw^r : w \in \{a, b\}^*\}$

9. a) Construct turing machines that will accept the language. (10 Marks)

$L_1 = L(aba^*b)$   
 $L_2 = L(a^n b^{2n})$

b) Elaborate on Chomsky’s Hierarchy. (5 Marks)

c) Briefly explain about P and NP classes. (5 Marks)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2050 Unix Architecture**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Sketch the block diagram of system kernel and explain the mechanism behind file subsystem and process control subsystem. (15)

- b. Draw and explain the various process states and its transition. (5)

**OR**

2. a. Explain the various scenarios for retrieval of a buffer with its algorithm and neat diagram. (15)

- b. List the advantages and disadvantages of buffer cache. (5)

3. a. Write an algorithm for the conversion of a path name to an inode with relevant example. (10)

- b. Consider a disk block contains 1024 bytes. If a process wants to access a file with byte offset 500000, Sketch the block layout using *bmap* algorithm to find out in which block number and in which byte number is this given byte offset present. (10)

**OR**

4. a. Explain the system calls required for accessing an existing file with required syntax and examples. (10)

- b. Describe an algorithm for creation of regular file in the system with example. (10)

5. a. List the sequence of operations done by the kernel for fork system call with algorithm. Write an C/C++ program to illustrate the scenario when a parent process P has two child processes C1 and C2. (15)

- b. What are interrupts? Write the steps to handle them. (5)

**OR**

6. a. Write an algorithm to handle signals after recognizing their existence and explain it. (10)

- b. How can process increase or decrease the size of its data region? Explain the various system calls and algorithms associated with it. (10)

7. a. Explain swapping in memory management with the necessary algorithms and diagrams. (10)

- b. Elucidate the need for demand paging and explain the four major data structures to support demand paging. (10)

**OR**

8. a. Discuss an algorithm that schedules the processes for execution by the kernel. Calculate the scheduling priorities for 3 processes A, B and C created simultaneously when its initial priority is 60, base level user priority is 60, the clock interrupts the system 60 times a second. Assume the processes makes no system call and no other processes are in the ready to run state. (15)

- b. Give the syntax and example of the system calls associated with global system time and individual processes time. (5)

9. a. Explain the various system calls used by processes for sharing parts of their virtual address space. Explain the various steps performed by the system call *shmat()* algorithm. (15)

- b. How is process tracing useful for debugging. (5)

**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2066 TCP/IP**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. (a) A 100-byte message is sent through a private internet using the TCP/IP protocol suite. If the protocol adds a 10-byte header at each layer, what is the efficiency of the system? (5)  
(b) Explain the functionality of each layer in OSI Model. (15)

**OR**
2. (a) Imagine the length of a 10Base5 cable is 2500 meters. If the speed of propagation in a thick coaxial cable is 200,000,000 meters/second, how long does it take for a bit to travel from the beginning to the end of the network? Ignore any propagation delay in the equipment. (5)  
(b) Compare and Contrast CSMA/CD with CSMA/CA (8)  
(c) Explain various Switched WAN Technologies available to connect to the network (7)
3. (a) If a label in a connection-oriented service is  $n$  bits, how many virtual circuits can be established at the same time? (2)  
(b) Assume a destination computer receives several packets from a source. How can it be sure that the fragments belonging to a datagram are not mixed from the fragments belonging to another datagram? (2)  
(c) Why do we need fragmentation at each router? Use suitable diagram for the explanation. (8)  
(d) How many hexadecimal digits are needed to define the netid and hostid in each class of IP (8)

**OR**
4. (a) A host with IP address 137.23.56.23/16 sends a packet to a host with IP address 137.23.67.9/16. Is the delivery direct or indirect? Assume no subnetting. (2)  
(b) Describe the routing table with example. (8)  
(c) Explain the Delivery and Forwarding mechanism of IP Packets. (10)
5. (a) With neat Sketch Explain the header structure of IPv4 (10)  
(b) Explain the mechanism used in network to obtain MAC address providing the IP Address of a node. (10)

**OR**
6. (a) Is registration required if the mobile host acts as a foreign agent? Explain your answer. (5)  
(b) Write short notes on Mobile IP. (15)
7. (a) Compare and contrast distance vector and Link state routing. (8)  
(b) What are the various timers used by Routing Information Protocol. (8)  
(c) What are the types of packets used in Border Gateway Protocol. (4)

**OR**
8. (a) With neat Sketch explain the header structure of UDP. (8)  
(b) Explain the full close and half close connection termination in TCP. Use appropriate diagrams (8)  
(c) What is the maximum size of the TCP header? What is the minimum size of the TCP header? (4)
9. Show the contents of all fields for a DHCP request packet sent from a client with physical address

00:11:21:15: EA: 21. Explain the Request and Reply format of this packet. Neatly sketch the header format in transport, Network layer for it's to and fro journey.

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS2068 Essentials of Programming**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. What is an operator? Explain the arithmetic, relational, logical and assignment operators in C language. (10)  
b. What is pseudo code? How is it used as a problem-solving tool. (6)  
c. Write a program in C to print the numbers from 4 to 9 and their squares. (4)

**OR**

2. a. Explain the different types of computers with examples. (10)  
b. Write a C program to solve a quadratic equation. (10)
3. a. Explain the two way selection (if, if-else, nested if-else, cascaded if-else) in C language with syntax. (10)  
b. Develop a C program to read a year as an input and find whether it is leap year or not. Consider end of the centuries. (5)  
c. Develop a C program to reverse of an integer number NUM and check whether it is PALINDROME or NOT. (5)

**OR**

4. a. Create an online application to purchase the stationary items for school students using switch statement (minimum of 5 students should be considered). (10)  
b. Write a C program to check whether given number is prime or not. (4)  
c. Write a C program to demonstrate the following. (6)  
(i) If the student gets second class and the number of subjects he failed in is greater than 2, then he does not get any grace marks.  
(ii) If the number of subjects he failed in is less than or equal to 2, then the grace mark is of 4 marks per subject.

5. a. Write a C program to swap two numbers using pointers and function. (10)  
b. Write a C program to enter n elements in array and find second smallest number from an array. (6)  
c. What are the different ways to initialize an array? Give examples. (4)

**OR**

6. a. Write a C program to perform matrix addition and matrix subtraction array. (10)  
b. Write a C program to sort the input numeric values in ascending and descending order. (10)

7. a. Write a C program that implements string copy operation STRCOPY(str1, str2) that copies a string str1 to another string str2 without using any library function. Reads a sentence and prints frequency of each of the vowels and total count of consonants. (10)  
b. Write a C program to maintain a record of "n" student details using an array of structures with four fields (Roll number, Name, Marks, and Grade). Each field is of an appropriate data type. Print the marks of the student given student name as input. (10)

**OR**

8. a. Explain the various storage classes in C with examples. (10)  
b. Explain array of structures and structure within a structure with examples. (10)

9. a. What is a file? How do the file open and file close functions. (10)  
b. Explain the following with example  
i) getw() ii) putw() iii) feof() iv) fgetc() (10)

**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3003 Advanced Computer Architecture**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. i. Some operations on two operands (subtraction, for example) are not commutative. What are the advantages and disadvantages of the stack, accumulator, and load-store architectures when executing non-commutative operations? (10)
- ii. State and explain the law which is used to calculate the performance gain obtained by improving some portion of a computer. (10)

**OR**

2. Characterize the architectural operations of SIMD and MIMD computers. Also, explain the differences among UMA, NUMA, COMA and NORMA computers. (20)
3. i. How is it possible to extend MIPS pipeline to handle floating point operations? (10)
- ii. Discuss the type of hazard occur during the execution of the following instructions with pipelining, how you deal with it. (10)

|      |            |
|------|------------|
| DADD | R1, R2, R3 |
| DSUB | R4, R1, R5 |
| AND  | R6, R1, R7 |
| OR   | R8, R1, R9 |

**OR**

4. Discuss the various ways in which the addresses are specified by instructions. (20)
5. Explain the extension of MIPS pipeline to handle multicycle operations with suitable diagrams. (20)
- OR**
6. i. Compare and contrast RISC and CISC architectures. Discuss the architectural distinctions of both. (15)
- ii. With neat diagram explain VAX 8600 processor architecture. (5)
7. How the branch costs are reduced with dynamic hardware prediction. (20)
- OR**
8. Explain the technique, in which the hardware rearranges the instruction execution to reduce the stalls while maintaining data flow and exceptional behavior. (20)
9. i. Explain the temporal locality, spatial locality and sequential locality associated with program/data access in a memory hierarchy. (10)
- ii. Explain the difference between superscalar and VLIW architectures in terms of hardware and software requirements. (10)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3005 Advanced Database Systems**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Draw the relational algebra tree for the following query. Provide atleast two alternative plans to evaluate this query. Show the impact of pushing selection down, selection methods, join methods and the availability of appropriate indexes.

**Emp** (eid : number(10), did : number(10), salary : number(10), manager name : varchar2(10))

**Dept** (did : number(10), dname : varchar2(10), location : varchar2(10), floor : number(10))

Query: Select D.did, E.eid, E.salary

From Emp E, Dept D

Where E.did = D.did AND D.floor=1 AND E.salary = 1500 AND E.eid = 10;

Statistics :

- Emp: Each tuple is 100 bytes long, 80 tuples per page, 500 pages.
- Dept: Each tuple is 80 bytes long, 70 tuples per page, 50 pages.

Note: Write down all the assumptions made in deriving the plan and calculating the cost. (14)

- b. What is an unrecoverable schedule? How can we avoid such a schedule? Explain the concept using a suitable example. (6)

**OR**

2. a. What is the purpose of serializability graph? Consider the following schedule S1. Draw the precedence graph (serialization graph) and state whether it is conflict serializable. (6)

S1: R<sub>1</sub>(Y); R<sub>2</sub>(Z); R<sub>1</sub>(Z); R<sub>3</sub>(X); R<sub>3</sub>(Y); W<sub>1</sub>(X); W<sub>3</sub>(Y); R<sub>2</sub>(Y); W<sub>2</sub>(Z); W<sub>2</sub>(Y)

- b. Describe and compare deadlock detection and prevention schemes.

Consider the schedule S1 in Q2.a. Insert locks and draw the wait-for graph for S1 and state whether it is a deadlock free schedule. (14)

3. a. Consider the following sequence of actions of S1 and S2. Insert the appropriate locks (shared and exclusive) and describe how the concurrency control mechanism will handle the sequences. (10)

S1: R<sub>1</sub>(A); R<sub>2</sub>(B); R<sub>3</sub>(C); R<sub>1</sub>(B); R<sub>2</sub>(C); R<sub>3</sub>(A); W<sub>1</sub>(A); W<sub>2</sub>(B); W<sub>3</sub>(C)

S2: R<sub>1</sub>(A), W<sub>2</sub>(B), W<sub>2</sub>(A), W<sub>3</sub>(B), W<sub>1</sub>(B)

- b. Explain how the use of strict 2PL would prevent interference between two transactions (4)

- c. Give example schedules with actions of transactions T1 and T2 on objects X and Y that results in (i) write-read conflict and (ii) read-write conflict (6)

**OR**

4. a. What are the three main principles of ARIES recovery algorithm? Explain the tasks performed during the Analysis, Redo and Undo phases of ARIES algorithm using the following log information. (15)

|     |     |
|-----|-----|
| LSN | LOG |
|-----|-----|



|                  |                       |
|------------------|-----------------------|
| 00               | begin_checkpoint      |
| 10               | end_checkpoint        |
| 20               | Update: T1 writes P5  |
| 30               | Update: T3 writes P3  |
| 40               | T1 abort              |
| 50               | T3 Commit             |
| 60               | Update: T2 writes P4  |
| 70               | T3 end                |
| 80               | Update : T2 writes P2 |
| 90               | Update : T2 writes P5 |
| 100              | T2 abort              |
| X Crash, Restart |                       |

b. Explain what happens if there are crashes during the Undo phase of recovery. What is the role of CLRs? Update the log record in Q4.a during the recovery process if there are repeated crashes. (5)

5. a. What are the choices available to tune indexes? What is index only plan? Explain with suitable illustration. (5)

b. You are the DBA of an 'Educational Institution' and created a relation called 'Students' with attributes studid, dept and CGPA. (9)

You have authorized your secretary to access and update students' details and to allow other faculty members to read Students' table. Write the corresponding SQL statement for each privilege. Your secretary has authorized faculty 1 and faculty 2 to read the table. Additionally, you have authorized faculty 1 to update the table. Later you have revoked secretary's privileges. What happens to the privileges of faculty members in general? Write the corresponding set of SQL privilege statements and explain the entire scenario using Authorization Graph.

c. What is a Trojan horse attack and how can it compromise discretionary access control? Explain with illustration how mandatory access control protects against Trojan horse attack. (6)

**OR**

6. a. Discuss the three data partitioning techniques available to implement parallel databases. What are the merits and demerits of each technique? (15)

Consider Department (did:integer, dname:string, budget:real) relation stored in India. The relation contains 100 tuples. Explain how this relation will be partitioned across five computers in India using partitioning techniques.

b. Discuss how each of the following operators can be parallelized using data partitioning in parallel databases: scanning and sorting. (5)

7. a. What is the difference between synchronous and asynchronous replication techniques? Describe the approaches of both the replication techniques. (15)

b. What are the choices for managing locks in a distributed DBMS? (5)

**OR**

8. a. Consider the following relations which are stored in distributed fashion with Employees (eid:integer, did:integer, sal:real) stored at Singapore and the Departments (did:integer, mgrid:integer, budget:integer) stored at Dubai. Each relation contains 10-byte tuples. The employees relation contains 100 pages and Department relation contains 200 pages. Page size is 100 tuples/page. The I/O cost of one page is  $t_R$  and the cost of shipping one page is  $t_S$ .

What are the ways to join these two tables? Calculate the cost of joining these tables. (14)

b. Why recovery in a distributed DBMS is more complicated than in a centralized system? Describe and compare two-phase commit protocol (6)

9. a. Consider the following points and regions, with x and y coordinates each of 3 bits. A: (2,2), B:(4,1), C(2,5), D: rectangle corners (0,6), (1,6), (1,7), (0,7), E: rectangle corners (5,3), (6,3), (6,5), (5,5). Use Z-ordering space-filling curve to represent these. Describe how can you use an index based on Z-order, to find the regions

or points that intersect the rectangle whose corners are (2,1), (5,1), (5,3), (2,3) (10)

b. What are the ways to measure the document similarity? Use the vector space model and calculate the IDF for each term in the following documents and determine the weight vector of each document. Evaluate the Boolean queries (i) Car AND Auto AND Zen, (ii) Hondo AND (Bus OR Zen). (10)

| Doc ID | Terms                     |
|--------|---------------------------|
| 1      | Car, Bike, Manufacture    |
| 2      | Auto, Hondo, Car, Maruthi |
| 3      | Maruthi, Bus, Car         |
| 4      | Hondo, Bike, Scooty, Zen  |

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3006 Advanced Operating Systems**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

- 
1. a. What is critical section? Explain early mechanisms for handling mutual exclusion. Discuss the disadvantages of early mechanisms and demonstrate the suitable solution for critical section problem. (10)  
b. What is distributed systems? List the advantages and disadvantages of distributed systems. Classify distributed systems based on system architecture. (10)

**OR**
  2. a. Write short notes on monolithic kernel structure and collective kernel structure. (10)  
b. State the Implementation Rule (IR) for Lamport's logical clock. List the limitations of Lamport's clock, also apply necessary changes in Lamport's logical clock to overcome this limitations. (10)
  3. a. Discuss transfer policy, selection policy, location policy and information policy in receiver initiated algorithm with a necessary diagram. (10)  
b. Differentiate centralized deadlock detection algorithms and distributed deadlock detection algorithms. Explain any one of centralized deadlock detection algorithms. (10)

**OR**
  4. a. What is the need of common agreement in distributed systems? Classify the agreement problems in distributed systems. Suggest solution to the Byzantine agreement problem. (15)  
b. Differentiate synchronous and asynchronous computations. (5)
  5. a. Show that how fault in system leads to system failure. How systems are recovered from failure? What are the different approaches in restoring an erroneous state to error free state. (10)  
b. Demonstrate the two phase protocol to enforce the global atomicity in system failure. (10)

**OR**
  6. a. Explain operation based approach and state based approach in error recovery. (10)  
b. Illustrate how the rolling back of process can cause following problems. (10)  
i) Orphan Message and Domino Effect ii) Lost Message iii) Problem of Livelocks
  7. a. Draw and show an 8\*8 Omega multistage interconnection network. (3)  
b. What is cross bar switch? (3)  
c. Apply capability-based addressing to implement an access matrix (P) of system X. List the limitations of capability-based addressing mechanism. Identify and demonstrate other suitable addressing mechanism on system X to overcome this limitation. (14)

**OR**
  8. a. What is a multi processor system? Classify multiprocessor systems based on memory location and accessibility of the main memory to the processors. (10)  
b. What are the two approaches in database system design? Explain how database operating systems supports complex and persistent data? (10)
  9. a. Why are timestamp-based concurrency control algorithms free from deadlocks? List basic and multiversion timestamp ordering algorithms in increasing order of transaction abort. (5)

b. Consider two concurrent transactions T1 and T2, which write the same data object X and perform concurrency control using two-phase locking. Show that if T1 wrote X before T2 wrote it, then the lock-point of T1 must precede the lock-point of T2. (5)

c. Explain the architecture of distributed database system with necessary diagrams. (6)

d. Consider the following three transactions. Find w-w, w-r conflicts among the transactions. (4)

T1: RS(T1) = {d1,d3,d5}                      WS(T1) = {d2,d5}

T2: RS(T2) = {d2,d3,d4,d5}                  WS(T2) = {d3,d4,d3,d2}

T3: RS(T3) = {d1,d2,d3,d4}                  WS(T3) = {d1,d2,d3}

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3008 Analysis, Architecture and Design of Networks**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Discuss Service Characteristics and Performance Characteristics in detail. (10 Marks)
- b. Which of the following applications require best-effort (unpredictable and unreliable), guaranteed (predictable and reliable, with accountability), or predictable service. Give reasons for your choices. (10 Marks)
- i) High-quality (phone company-grade) voice calls
  - ii) Voice over IP (VoIP) calls
  - iii) File transfers via FTP
  - iv) Audio file downloads
  - v) A commercial video-on-demand service

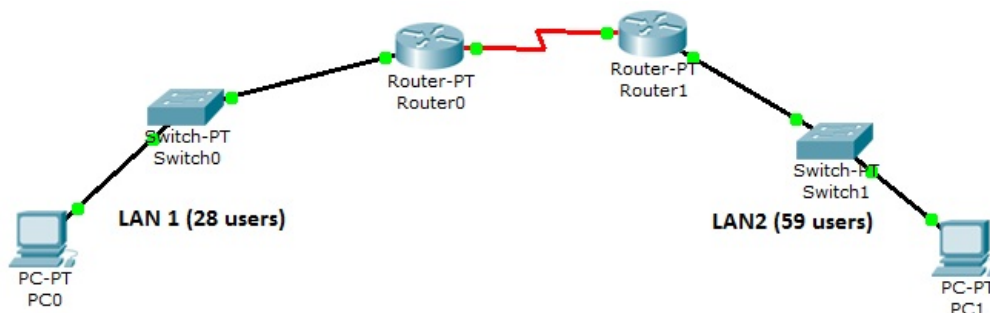
**OR**

2. a. What are the various measures of availability of your network? Given an MTBCF requirement of 8000 hours and an MTTR requirement of 4 hours, calculate an availability requirement. (8 Marks)
- b. Differentiate mission-critical, rate-critical, real-time and non-real time applications. Give examples for each type of applications. (12 Marks)
3. a. Define flows in Network analysis. With neat diagrams and examples elucidate all the flow models. (10 Marks)
- b. Discuss the necessity of requirement architecture in developing a high-level, end-to-end structure for the network. (10 Marks)

**OR**

4. a. What are the differences between the LAN/MAN/WAN and Access/Distribution/ Core architectural models? Under what conditions might each be applied to a network? (10 Marks)
- b. Define Component architecture. Tabulate the primary functions of component architecture, its description capability and example Subset of Mechanisms used to achieve capability. (10 Marks)

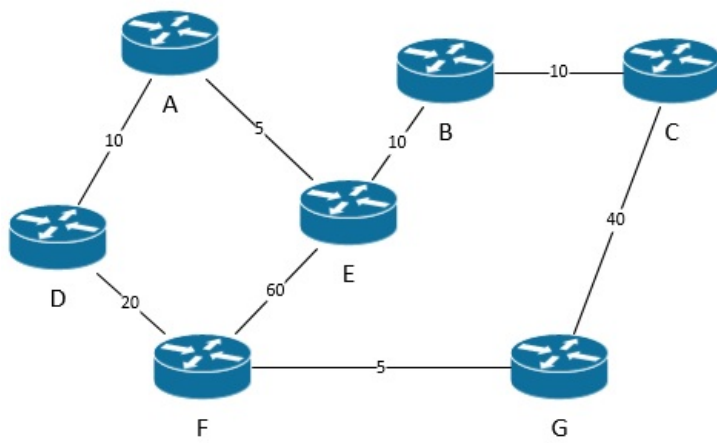
5.



- a. Refer to the exhibit. Given Class C address is 192.168.74.0. Apply Subnetting concept and assign IPs to all the users of each network. (10 Marks)
- b. How will you ensure that your network addresses and masks will scale to the sizes of the areas to which they will be assigned? (10 Marks)

**OR**

6. a. Refer to the exhibit. Write link state routing algorithm. Find a best path from the source node 'D' to all possible destinations using link state algorithm. (15 Marks)



b. With suitable examples, elucidate how the specific routing mechanism is applied to your network. (5 Marks)

7. a. For each of the SNMP commands *get*, *get-next*, and *set*, describe what each command does and give an example. (10 Marks)

b. Refer to the performance requirements listed here. (10 Marks)

Requirement 1: A requirement to bill subscribers for network service and to provide accounting of subscriber billing information

Requirement 2: Combining a customer's voice and data traffic over a common network

Explain why performance mechanisms are needed to support the requirement.

**OR**

8. a. Write description of ping, tracert and pathping commands and discuss the output of these commands. (10 Marks)

b. What is in-band and out-of-band data? With various network management mechanisms how are they managed in a network? (10 Marks)

9. a. For the following primary design goals, list at least two secondary or derivative design goals. Explain your answers. (10 Marks)

i) Minimizing WAN costs

ii) Simplifying network management

iii) Maximizing supportability

iv) Scaling the network (From LAN to WAN, To increase the number of users by 50%)

b. Discuss the vendor, equipment, and service provider evaluations. (10 Marks)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3011 Cloud Computing Services**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

- 
1.       a. Bring out the implication of how does cloud computing helps to reduce the time to market for applications and also to cut down the capital expenses. (10)  
  
          b. SaaS applications can serve the needs of identifying concerns related to interactions with customers and prospect sales thus enabling software systems to simplify the process of managing customers and identifying sales strategies. Explain the context with a most successful and popular example. (10)  

**OR**
  2.       a. List and discuss different types of virtualization. What are the benefits of virtualization in the context of cloud computing? (10)  
  
          b. Discuss about the major distributed computing technologies that led to cloud computing. Give some examples of Web 2.0 applications (10)
  3.       a. Discuss the architecture of Hyper-V and its use in cloud computing to provide the illusion of a specific environment by using emulation or abstraction for the services delivered through the Internet. (10)  
  
          b. Message based communication constitutes a fundamental block for distributed programming paradigms elucidate on the various client/server models for different interaction patterns. (10)  

**OR**
  4.       a. Elucidate the computing platforms and technologies for development of a cloud computing application that provide different types of services, from the bare metal infrastructure to customizable applications serving specific purposes. (10)  
  
          b. Classify the various deployment Infrastructure models of cloud with relevant examples. (10)
  5.       a. Briefly explain the Crowbar Architecture and how it adds benefit to the OpenStack cloud environment. (10)  
  
          b. Mention the solutions available to meet the increasing demand of all cloud users scalability goal and list out the default OpenStack flavors. (10)  

**OR**
  6.       a. Explain the deploying order and procedure of OpenStack Services which enables to finalize the installation of SUSE cloud private infrastructure. (10)  
  
          b. Discuss on Persistent storage for cloud users that outlives any other resources and is always available regardless of the state of running instance in influencing performance and security needs (10)
  7.       a. Cloud Storage Services is a significant aspect in SUSE Cloud. Bring out the features of cloud storage services, its hardware requirements and recommendations for the various types of nodes in the SUSE cloud infrastructure. (10)  
  
          b. Explain the multi-step process of deploying and installing of SUSE cloud enabling the add-on product to the Administration Server along with the update repositories and cloud network configuration. (10)  

**OR**
  8.       a. Discuss about PXE-booting provided by the tftp server from the Administration Server for the installation of the Control, Compute and Storage Nodes. (10)  
  
          b. Few services may not be installed on the control nodes name them. Justify why they are to be installed on the dedicated nodes with the deployment procedures. (10)
  9.       a. Discuss in detail the services provided by Openstack. Bring out the importance of these services for deploying and configuring the SUSE cloud environment (10)

b Write down the steps and its details for creating and configuring a project named “Cloud Computing Services” in SUSE cloud private infrastructure (10)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3013 MPLS and VPN**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

- |    |  |    |
|----|--|----|
| 1. | a Discuss the various bottlenecks faced by Traditional IP Routing. | 8  |
|    | b What is a Label Switched path?                                   | 2  |
|    | c How is a Label Switched path established in MPLS based Network.  | 10 |

**OR**

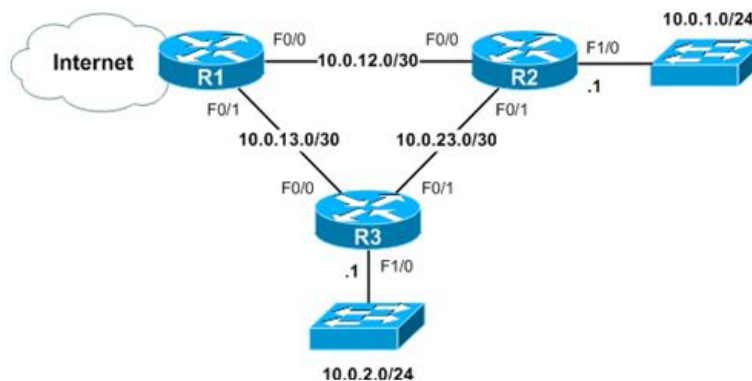
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|----|---|---|
| 2. | a Discuss the functionality of Edge-LSR.  | 7 |
|    | b What are the various Label allocation methods?                                | 5 |
|    | c What are the parameters used to set the Forwarding Equivalence class in MPLS? | 8 |

- |    |   |    |
|----|---|----|
| 3. | a How IP to Label binding performed in MPLS network?  | 15 |
|    | b What is the primary difference between the Label Forwarding Information Base (LFIB) and the Label Information Base (LIB)? | 5  |

**OR**

- |    |  |    |
|----|--|----|
| 4. | a What is the benefit of using VC-merge?   | 5  |
|    | b Explain the steps involved in forwarding labeled packet across ATM-LSR Domain. | 15 |

5. The packet forwarded by Router R2 in interface f0/1 is forwarded back to the same interface indefinitely. What could be the cause of this problem and explain the solutions adapted to solve it in Traditional IP and MPLS network.



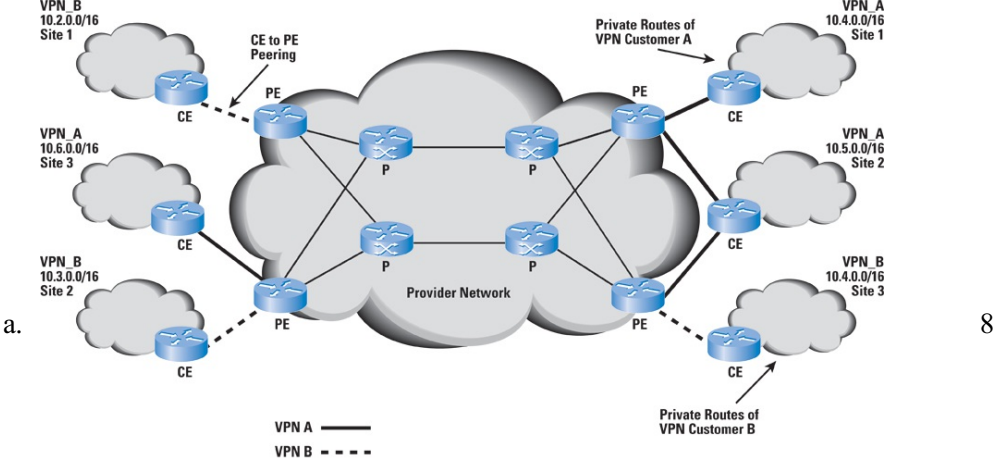
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**OR**

- |    |  |   |
|----|--|---|
| 6. | a Name the two major implementation models that describe Virtual Private Network (VPN) connectivity. | 4 |
|    | b Why is the hub-and-spoke topology most often used when the Overlay model is deployed?              | 4 |
|    | c Name two possible business problems that can be solved by using a VPN.                             | 4 |
|    | d With neat Sketch Explain the functional blocks of VPD Network.                                     | 8 |
- 
- |    |   |   |
|----|---|---|
| 7. | a How will a PE router exchange customer routing information? | 8 |
|    | b What is a Route distinguisher?                              | 4 |
|    | c Explain three steps involved in VPN Packet Forwarding.      | 8 |

**OR**

8.



- In the above topology it is observed that Site 1 of VPN\_A and Site 3 of VPN\_B share the same private IP range in their LAN. How does this issue solved in MPLS based VPN Network?
- b Give the format for Route Distinguisher. 4
- c What is a Route Target? Why are they implemented in MPLS VPN Network? 8

9.

- a When running OSPF PE CE, how many layers of routing hierarchy are necessary?4
- b How are routing loops prevented between sites when running OSPF PE CE? 10
- c Which feature is necessary to allow VPN sites to run the same autonomous system number? 6

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3017 Design and Analysis of Algorithms**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Write a pseudo code of quick sort, Illustrate the operation of QUICKSORT on the array A {31, 41, 59, 26, 41, 58} and Show that the running time of QUICKSORT is  $\theta(n^2)$  when the array A contains distinct elements and is sorted in decreasing order. (14)

b. Show that the solution of  $T(n) = 9T(n/3) + n$  is  $\theta(n^2)$  using master method. (3)

c. Use BUILD-MAX-HEAP procedure to construct the max-heap on the array A {1, 3, 17, 2, 4, 9, 6, 9}. (3)

**OR**

2. a. Rewrite the INSERTION-SORT procedure to sort into non increasing instead of non decreasing order. Illustrate the operation of INSERTION-SORT on the array A {31, 41, 59, 26, 41, 58}. (10)

b. Write a pseudo code BUCKET-SORT, illustrate the operation of BUCKET-SORT on the array A {79, 13, 16, 64, 39, 20, 89, 53, 71, 42} and analyze the running time. (10)

3. a. Show the red-black tree that result after successively inserting the keys 41, 38, 31, 12, 19, 8 into an initially empty red-black tree. (6)

b. Demonstrate what happens when we insert the keys 0, 1, 4, 9, 16, 25, 36, 49, 64, 81, into a Hash table with collisions resolved by chaining. Let the table have 10 slots, and let the hash function be  $h(k) = k \bmod 10$ . (6)

c. Write recursive versions of TREE-MINIMUM, TREE-MAXIMUM procedure for the binary search tree and analyze running time. (8)

**OR**

4. a. Write a procedure for activity selection problem and discuss the running time. (5)

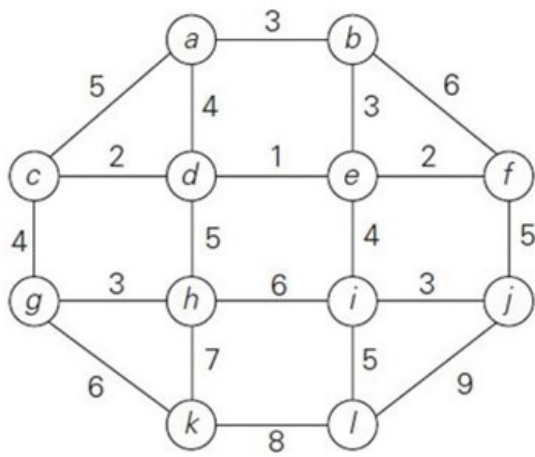
b. Given a set of keys (a, and, i, it, or) and their corresponding search probabilities 18, 22, 19, 20, 21 find a binary search tree for the keys such that the total search cost is minimum. (15)

5. a. Show the results of inserting the keys order: 1, 12, 8, 2, 25, 5, 14, 28, 17, 7, 52, 16, 48, 68, 3, 26, 29, 53, 55, 45, in order into an empty B-tree with degree 5. Draw only configurations of the tree just before some node must split, and also draw the final configuration. (12)

b. Explain Amortized Analysis. (8)

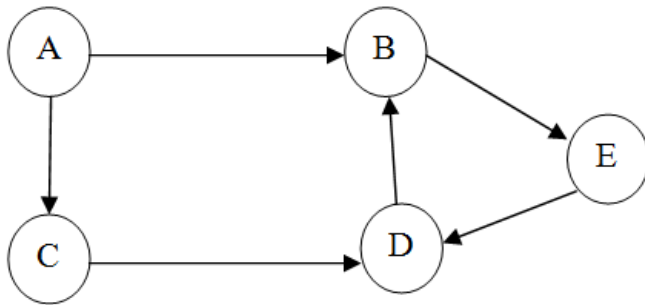
**OR**

6. a. Apply prim's algorithm to the following graph to find the Minimum spanning tree and write pseudo code of the prim's algorithm and analyze the running time. (16)



b. List the application of Minimum spanning tree. (4)

7. a. Run DFS algorithm on the following graph starting at A source vertex. Find out whether given graph is Directed acyclic graph or not. Write pseudo code of DFS and analysis the running time. (16)

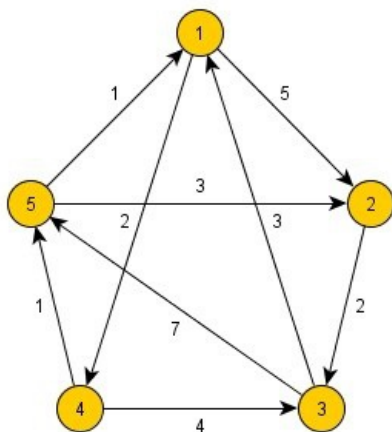


b. Compare and contrast DFS and BFS. (4)

**OR**

8. What is Linear Programming (LP) problem? Explain method for standard maximization problem. (20)

9. a. Use Floyd-Warshall Algorithm to find the shortest path between all pairs of vertices in the following graph. Write the pseudo code of Floyd's -warshall algorithm and discuss the time complexity. (14)



b. Given string  $T = "2359023141526739921"$ , String  $P = "31"$ ,  $q = 13$ , find occurrences of  $P$  in  $T$  using Rabin-Karp Algorithm. (6)

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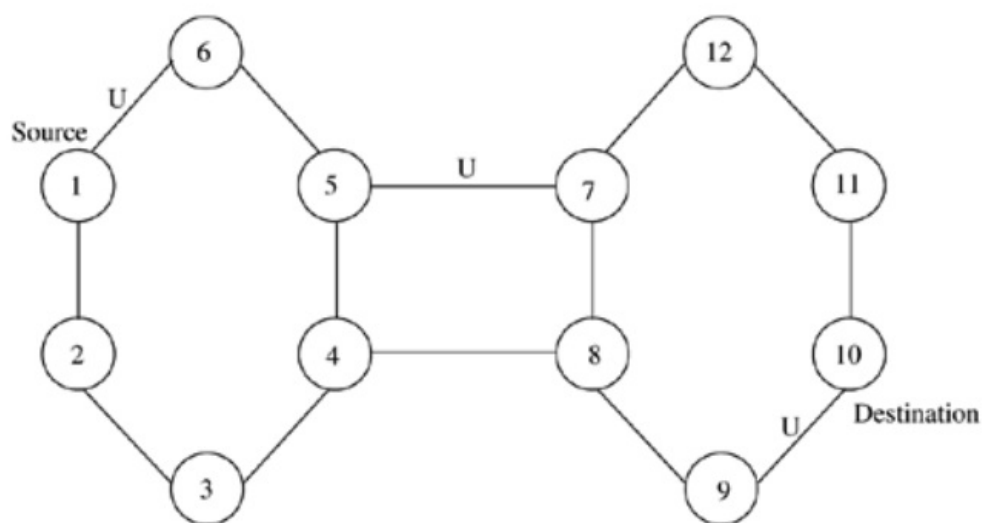
**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3018 Mobile Ad Hoc Networks**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

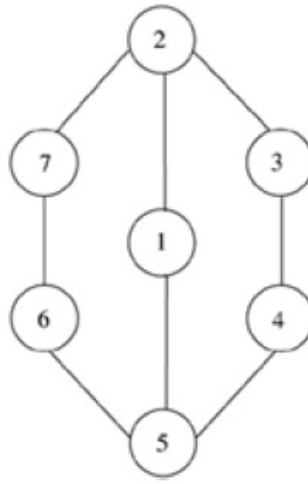
1. a. Brief the difference between cellular networks and ad hoc wireless networks?  
(5)  
b. In MACA, consider the case where a source node sends RTS signaling packet for its data transmission and waits to receive CTS. But, it did not receive CTS, because of collision, due to exposed terminal and hidden terminal. Explain the improvements or modifications made in MACAW to overcome these problems.  
(10)  
c. Why is power management important for ad hoc wireless networks? Explain.  
(5)
- OR**
2. a. Compare the pros and cons of using scheduling-based MAC protocols over reservation based MAC protocols.  
(7)  
b. What is meant by the carrier-sensing zone of a transmission? Does it have any effect on the performance of a MAC protocol?  
(7)  
c. How is synchronization between nodes achieved in the HRMA protocol?  
(6)
3. a. Explain the route establishment mechanism in DSDV routing protocol.  
(10)  
b. Consider the topology given in Figure 1, Simulate DSR protocol for path establishment from node 1 to node 10; find the paths found and the ratio of the number of route request packets sent in the network. (Links labeled “U” refer to unstable ones).  
(10)



**Figure 1**

**OR**

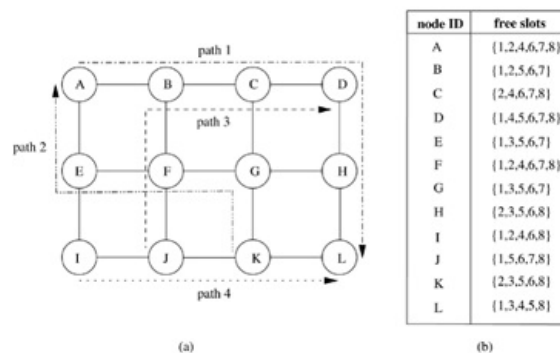
4. a. Both ABR and SSA use stability information for routing. How do they differ in using the stability information?  
(10)  
b. For the network shown in Figure 2, determine the fisheye routing table for nodes 7 and 5.

**Figure 2**

5. a. Compare the admission control mechanisms of INSIGNIA and SWAN framework. (10)

b. Consider the network topology shown in Figure 3(a). Assume that free slots available at various nodes are as given in Figure 3(b). Using the hop-by-hop path bandwidth calculation algorithm proposed in the BR protocol, calculate the end-to-end path bandwidth for the paths given below. (10)

- i. PATH1: A --> B --> C --> D --> H --> L
- ii. PATH2: K --> G --> F --> E --> A
- iii. PATH3: J --> F --> B --> C --> D
- iv. PATH4: I --> J --> K --> L

**Figure 3****OR**

6. Explain on demand links state multipath QoS routing protocol.

7. a. Explain the modeling and shaping of battery discharge patterns. (10)

b. List the possible steps of the algorithms executed at the source and the intermediate nodes of an ad hoc wireless network that follow the following strategies: (i) random strategy and (ii) pay for it strategy. Assume a session between source  $s$  and destination  $d$ . Let  $R(s,d)$  be the set containing the available routes between  $s$  and  $d$ ,  $\text{sympathy}(k,r)$  be the sympathy level of the  $k$ th node in route  $r$ , and  $\text{credit}(k,r)$  and  $\text{debit}(k,r)$  be the credit and debit of  $k$ th node in route  $r$ , respectively. (10)

**OR**

8. Explain the network layer solutions of battery management schemes.

9. Explain the data dissemination mechanisms of wireless sensor networks.

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3019 Distributed Systems**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Distributed systems are undergoing a period of significant change. Trace back to a number of influential trends and explain them. (10)  
  
b. Use the World Wide Web as an example to illustrate the concept of resource sharing, client and server. What are the advantages and disadvantages of HTML, URLs and HTTP as core technologies for information browsing? Are any of these technologies suitable as a basis for client-server computing in general? (10)  

**OR**
2. a. What are the entities that are communicating in the distributed system? How do they communicate, or, more specifically, what communication paradigm is used? (10)  
  
b. What (potentially changing) roles and responsibilities do they have in the overall architecture? How are they mapped on to the physical distributed infrastructure (what is their placement)? (10)
3. Sun XDR marshals data by converting it into a standard big-endian form before transmission. Discuss the advantages and disadvantages of this method when compared with CORBA CDR. (20)  

**OR**
4. a. How is indirect communication achieved in group communication? What are the implementation issues in Group communication? (10)  
  
b. Write an algorithm for implementing distributed garbage collector. (10)
5. a. It is often argued that peer-to-peer systems can offer anonymity for:  
  - i) clients accessing resources;
  - ii) the hosts providing access to resources.

Discuss each of these propositions. Suggest a way in which the resistance to attacks on anonymity might be improved. (10)

  
  
b. Routing algorithms choose a next hop according to an estimate of distance in some addressing space. Pastry and Tapestry both use circular linear address spaces in which a function based on the approximate numerical difference between GUIDs determines their separation. Kademlia uses the XOR of the GUIDs. How does this help in the maintenance of routing tables? Does the XOR operation provide appropriate properties for a distance metric? (10)  

**OR**
6. Discuss in detail how Andrew File System provides transparent access to remote shared files for UNIX programs running on workstations. (20)
7. a. What were the shortcomings seen in original Internet Naming scheme? (8)  
  
b. How does the DNS replace the original Naming scheme and achieves relatively short average response times for lookups, considering the amount of naming data and the scale of the networks involved? (12)  

**OR**
8. How do you whether a particular property is true of a distributed system as it executes?. Explain it, giving the examples of distributed garbage collection, deadlock detection, termination detection and debugging. (20)

- 9.
- a. What are the advantages and drawbacks of multiversion timestamp ordering in comparison with ordinary timestamp ordering? (10)
  - b. Explain the lock implementation in a distributed environment. (10)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3021 High Performance Networks**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Explain the layer 3 function of OSI model. (5)
- b. Explain the sequence of messages sent by bridges for discovering loop free routes on Ethernet network for the following diagram(Figure 1), where Bi – represents the bridges, all interconnected lines represent the communication links. (15)

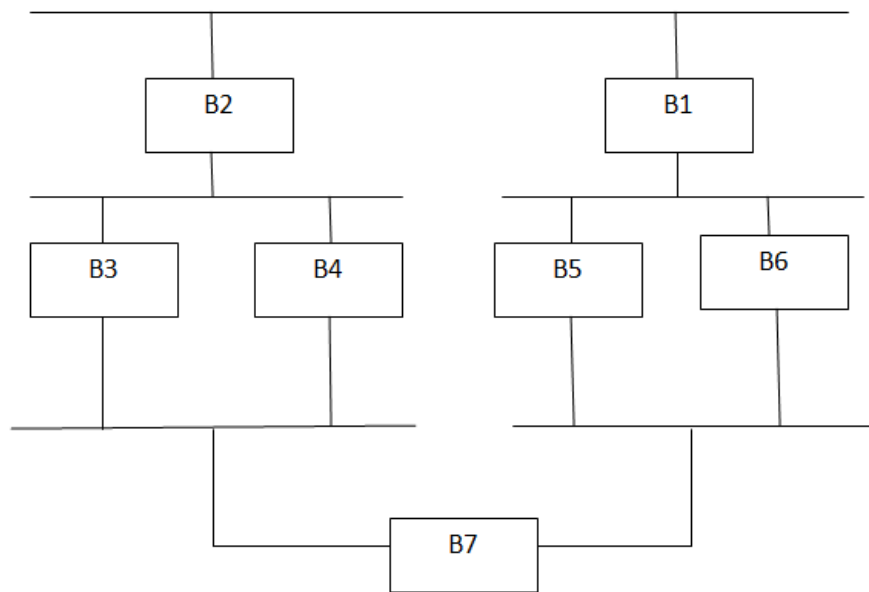


Figure 1. Ethernet Network

**OR**

2. a. Explain the medium access control mechanism of the token ring network and analyze its efficiency, if nodes 1, 2, 3, .....N are connected with each other by unidirectional point-to-point links around the ring,  $T_1, T_2, T_3, \dots, T_N$  are the time duration by the nodes to transmit their data, PROP is the time duration by the last packet to reach the node itself. (10)
- b. Explain the frame format of Frame relay network. (10)
3. a. Consider two scenarios, in scenario 1, computer A with IP address IP1.4 wants to send [data1] to computer B with IP address IP2.3. In scenario 2, computer A with IP address IP1.4 wants to send [data2] to computer C with IP address IP5.3. Explain the steps required for this packet transfer for both the scenarios for the following IP network(Figure 2) where R1, R2 represent routers, mac1.4 is the mac address of IP1.4 and so on, all lines represent communication links. (15)

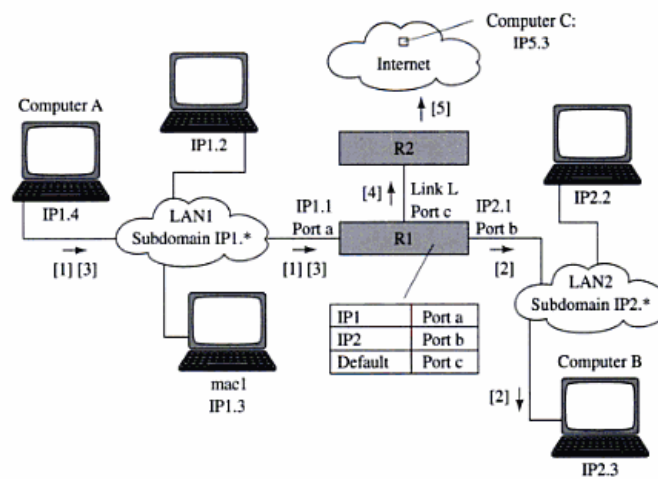


Figure 2. IP Network

b. Brief on SMTP, rlogin, TFTP and HTTP application protocols.  
(5)

**OR**

4. a. Explain the window adjustment mechanism of TCP. (10)

b. Compare and contrast the version 4 and version 6 of IP. (5)

c. If user, user1@cse.college1.edu send mail to user7@ece.college2.edu. Explain the steps processed in the background. (5)

5. a. Explain the SONET network elements and the layers of SONET overhead. (13)

b. How does the telephone network implement a call forwarding service? Explain. (7)

**OR**

6. a. Explain the signaling mechanism of ATM. (10)

b. Consider a ATM network with ATM cell size of 53 bytes (5 bytes – cell header), where the end devices exchange voice conversation with the following assumptions; voice is sampled 8000 times per second (once every 125 us), each sample is encoded into 1 byte with voice transmission speed of 64 Kbps. Propagation delay for electric/optical signal is 5 us. Length of path is 500 km. Transmission rate of the link is 155 Mbps. For traffic intensity of 80%, the number of cells on the output link of each switch is 3 cells. Total number of switches interconnects the end devices are ten. The fixed processing delay at each switch is 28 us. Calculate the total delay for the transmission of voice data between the end devices. (10)

7. Explain the channel access methods of wireless networks.

**OR**

8. Explain Datagram networks.

9. a. Explain optical links. (13)

b. Explain optical LANs. (7)

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**End Semester Examinations - Nov-Dec 2015 Exams**

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**14CS3027 Software Architecture Restructuring**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

- 
1. Write a program to calculate and print a statement of a customer's charges in a video store. The customer's charge depends on the number of movies rented by the customer and also on the type of movie. Use a method 'print\_statement' to do the same. Decompose the 'print\_statement' method and write the benefits of refactoring after decomposing the method. (20)

**OR**

2. (i) "Refactoring is a valuable tool". Describe the purposes of Refactoring in detail. (10)
- (ii) "Computer science is the discipline that believes all problems can be solved with one more layer of indirection". How does indirection help in refactoring. (10)

3. Examine how can extract class be used to remove the bad smells in code. (20)

**OR**

4. Why is the following not favorable in a program.

- a) Case statements (5)
- b) Parallel inheritance hierarchies (5)
- c) Temporary Field (5)
- d) Message Chains (5)

5. Analyze Red/Green/Refactor movement and write how it helps in building tests. (20)

**OR**

6. (i) Compare and contrast Developers test and Quality Assurance tests in detail. (10)
- (ii) Briefly explain why testing an exception is necessary. (10)

7. State why eliminating duplicating behavior is important and how it is implemented using pull-up method? (20)

**OR**

8. Comment on the statement "Replace the superclass with a module to better communicate your intention". (20)

9. Explain in detail the various clustering algorithms. (20)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3029 Network Management**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. What are the different types of distributed computing environments in networks? Illustrate with examples (10)  
b. What is meant by protocol? Explain the communication architecture and standards in network management system. (10)

**OR**

2. a. Describe the organizational model in simple network management protocol with suitable diagrams. (10)  
b. explain the analogy technology in telephone network model. (10)

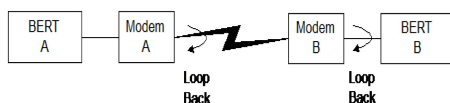
3. a. Differentiate SNMPv1 and SNMPv2.(5)  
b. Write short notes on the following: (15)  
(i)The SNMP architecture  
(ii)SNMP access policy  
(iii)SNMP community profile

**OR**

4. Explain the various SNMPv2 operations in detail with a neat sketch (20)
5. a. Give detailed notes on the following: (10)  
(i)SNMPv3 command generator  
(ii)SNMPv3 command responder  
b. What are the different ways to implement the SNMP version 3 management information base? (10)

**OR**

6. a. What is remote monitoring? Explain the RMON1 textual conventions and its advantages. (10)  
b. Discuss about RMON1 common and Ethernet groups. (10)
7. a. Write the various catalogs used in network management tools and classifies it based on the characters. (10)  
b. How the bit error rates are tested in the following diagram: (5)



- c. How is the basic configuration carried out in the protocol analyzer? Illustrate with a diagram. (5)

**OR**

8. a. Discuss about Web Interface to SNMP Management. (10)  
b. Elaborate on the embedded web-based management in the SNMP protocol. (10)

9. **Compulsory**

- a. Discuss the following in detail (20)
- i. WBEM Architecture
  - ii. WMI Architecture
  - iii. JMX Architecture

**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3032 Object Oriented Software Engineering**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. What is the purpose of modeling in software engineering? (4)  
b. What is meant by “knowledge acquisition is not sequential”? Provide an example of knowledge acquisition that illustrates this. (4)  
c. What is the difference between a task and an activity? (4)  
d. Discuss the sequence of activities involved in managing a software engineering project. (8)

**OR**

2. a. Explain schedule in project organization. Discuss any two diagrammatic notations used to represent the schedule. (8)  
b. Explain the different types of associations in UML class diagram with suitable example. (12)
3. a. Consider the problem statement of an online library management system and draw a use case diagram.(5)  
b. Explain the various relationships of UML use case modeling with suitable example. (7)  
c. Explain the communication mechanisms that are available to transmit and receive information and support a communication event.(8)

**OR**

4. a. Explain generalization and specialization. How are the concepts of generalization and specialization helpful in modeling class diagram? (7)  
b. Describe the Entity, boundary and control objects. Identify the entity, boundary and control objects from a withdrawal transaction use case of ATM system. (8)  
c. Assume that you are responsible for coordinating the development of a system for banking. In what roles would the following participants be able to contribute most to the project? (5)
1. A bank employee responsible for processing credit applications.
  2. The manager of the information technology group at the bank, who contracted the system.
  3. A freelancer who developed similar systems in the past.
  4. A technical writer.
5. Explain the following system design activities in detail.
1. Providing access control
  2. Designing global control flow
  3. Identifying boundary conditions

**OR**

6. a. Write short notes on
1. Specification inheritance and Implementation inheritance. (4)
  2. Delegation and inheritance in design pattern. (4)
- b. What is design pattern? Explain the following design patterns with suitable UML class diagram. (12)
1. Adapter design pattern
  2. Strategy design pattern

7. a. Explain how to map the following object model components into a persistent storage schema. (16)
1. Classes and attributes.
  2. One - to- one association.
  3. many - to- many association.
  4. Inheritance relationship.
- b. Discuss the various transformation principles should be followed by the developer during model transformation in order to avoid the chances of new error. (4)

**OR**

8. a. Explain the following configuration management concepts. (8)
1. Versions and configurations
  2. Promotions and release
  3. Repositories and workspace
- b. Explain the configuration management activities that are needed to define and manage configuration items, promotions and releases. (7)
- c. How does the manager find the right participants to perform the task using skill matrix and explain the skill matrix with suitable example?(5)
9. a. Explain in detail about project management activities. (10)
- b. Discuss the workflow of Boehm's spiral model and the unified software development process model in detail. (10)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3040 Enterprise Service Oriented Architecture**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1.
  - a. Draw the block diagram of asynchronous scenario in service oriented architecture (2)
  - b. List out the pros and cons of synchronous scenario as well as asynchronous scenario in service oriented architecture (6)
  - c. Mention few recommendations to improve the service oriented architecture in both synchronous and asynchronous scenario. (6)
  - d. Mention key components of SOA and draw the flow chart that represents the sequence of key components in SOA (6)

**OR**

2.
    - a. Draw the implementation diagram of service registry in SOA governance (4)
    - b. Discuss the types of service registry in SOA (4)
    - c. Explain the roles, access requirements, standards and policies of NAS service registry (10)
    - d. Why service registry/repository is needed in SOA ? (2)
  3.
    - a. Discuss the enterprise service oriented architecture framework with the diagram (10)
    - b. What is SAP's methodology for enterprise SOA development (10)
- OR**
4.
    - a. Describe the interaction of process components in simple sales process integration scenario (10)
    - b. Draw the meta model of the specification and design phases and discuss the governance process for data types (GDTs) (10)
  5.
    - a. Draw the fundamental software technology architectures (2)
    - b. Write the basic steps expected to be done in service processing tasks (6)
    - c. Discuss the relationship between service oriented architecture layers and technologies (10)
    - d. Describe the process of message processing logic (2)

**OR**

6.
  - a. Elucidate the organizational and technology aspect of service oriented architecture development (9)
  - b. Discuss the process modelling for end to end procurement process from state owned power distribution company (8)
  - c. Write the basic requirements for development processes and methods (3)
7.
  - a. What is service oriented architecture? (2)
  - b. Explain the characteristics of service oriented architecture (10)
  - c. List out the benefits of service oriented architecture. (5)
  - d. Draw the block diagram of service oriented architecture(3)

**OR**

8.
  - a. Explain the service oriented architecture platform layers with the neat diagram (10)

b. Discuss the service oriented architecture support with dotnet framework (10)

9.

a. List out the common task expected to be performed by the service provider (10)

b. Draw the block diagram of task centric business service design process and discuss its steps (10)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3042 Software Project Management**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. (i) Explain the initiating and monitoring and controlling project management process groups and their functions.(10)
- (ii) What is Procurement Management Life Cycle? List the various processes involved in Procurement Management Life Cycle.(10)

**OR**

2. (i) What is Project Overview Statement? Explain the various components involved in an effective project overview statement. Consider an application for online competitive examination which automates the competitive examinations conducted by various organizations like TNPSC, UPSC, IBPS and so on. The system is able to generate different sets of question papers for different candidates who are attending examination and able to give the list of top scorers according to the number given by the conducting organization. Create a project overview statement for the above scenario and present it in the prescribed format. (15)
- (ii) Compare and contrast the linear and incremental Project Management Life Cycle models.(5)
3. (i) Explain the use cases, use case diagrams and their role in prototyping a solution? (10)
- (ii) What are conditions of satisfaction? How effective conditions of satisfaction can be arrived at for a project? (10)

**OR**

4. (i) A software company planned to recruit development team for a recently accepted automation project. The project automates the various transactions involved in super market. Apart from the regular operations, the system should be intelligent enough to forecast and report the demand of perishable items. The project is developed using java and oracle DBMS. Assign team members for the above project using need matrix, skill matrix and staff allocation matrix.(10)
- (ii) Explain the various situations requiring team operating rules.(10)
5. Discuss the different types of project status reports, their advantages and drawbacks.(20)

**OR**

6. (i) Compare and contrast traditional project management and critical chain project management.(10)
- (i) iAdding contingency can reduce the project time. Justify with a real time example. (10)
7. (i) Discuss the different decision making models. State and justify the best model in your point of view.(10)
- (ii) Explain the activity-on-the arrow and the network diagram techniques of representing the schedule of the project activities. (10)

**OR**

8. (i) Assume that you are the client of a project. The company informs you that the project is completed and invites you to formally close the project. As a client what are the steps you will be taking to close the project ceremonially and formally. (10)
- (ii) Discuss the problem escalation strategy hierarchy. (10)
9. Discuss the portfolio management lifecycle with suitable diagrams.(20)



**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3043 Software Testing**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. How does a tester view the software under test as a black box with defining the inputs and outputs? State the list of conditions to be specified for performing equivalence class partitioning. (10)
- b. In a system designed to work out the tax to be paid: An employee has £4000 of salary tax free. The next \$1500 is taxed at 10%. The next \$28000 after that is taxed at 22%. Any further amount is taxed at 40%.

To the nearest whole pound, which of these groups of numbers fall into three different equivalence classes?

(10)

- a. \$4000; \$5000; \$5500
- b. \$32001; \$34000; \$36500
- c. \$28000; \$28001; \$32001
- d. \$4000; \$4200; \$5600

**OR**

2. Explain about the technique that is used to strengthen equivalence class partitioning. Point out the rules-of-thumb used for getting started with the boundary value analysis. (20)
3. Your organization has worked very hard to improve its testing process. The most recent test process assessment using the Testing Maturity Model showed that you are at TMM Level 3. How would you describe your current testing process based on that assessment? What are the maturity goals that you have achieved at that TMM level? (20)

**OR**

4. Suppose you are testing a code component and you discover a defect: It calculates an output variable incorrectly.
  - (a) How would you classify this defect?
  - (b) What are likely causes of this defect?
  - (c) What steps could have been taken to prevent this type of defect from propagating to the code?(20)
5. You are developing a module whose logic impacts on data acquisition for a flight control system. Your test manager has given you limited time and budget to test the module. The module is fairly complex; it has many loops, conditional statements, and nesting levels. You are going to unit test the module using white box testing approaches. Describe three test adequacy criteria you could consider applying to develop test cases for this module. What are the pros and cons for each. Which will have the highest strength? (20)

**OR**

6. Your team is developing a patient record system for a medical group that will contain vital patient information as well as billing data for the medical practice. This is the first time your company is developing software for this domain. The test manager is developing the test plan and is deciding on appropriate stop test criteria for this project. Which of the stop test criteria described in this chapter do you believe is appropriate for this project? Give reasons for your choice(s). (20)
7. Test – related documents are developed and used before, during, and after execution – based testing. The test plan is a test – related document that is prepared before execution – based testing takes place.

i) What are some of the essential items a tester should include in a test plan?

ii) Describe the test – related documents that are developed during, and after execution – based testing. Include in the description how these documents are used by managers, developers, and testers.

(20)

**OR**

8. A Test Plan has as a goal 100% branch coverage for all units. The test effort is running behind schedule and current status of coverage for all units is 87%. The manager is under pressure and is thinking of stopping unit test at this point. The project is a straightforward business application. The development group has implemented similar applications in the past. Advise the manager about the decision. What types of data will be useful to support a decision?  
(20)

9. Your organization is assessed to be at TMM Level 2. Your project manager is reluctant to provide resources to purchase testing tools. Give an argument to convince him or her of the usefulness of test tool support. Which tools would you recommend for your organization at thi stage of test process maturity? (20)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**Set  
B**

**Time : 3 hrs  
Total Marks: 100**

1. Holt Valley Hospital Services, Inc., is a large healthcare services company that acquired W. Wilson Hospital, an acute-care hospital, this past year. This is a large facility with a typically long collection cycle for its patients' accounts receivable. During the annual audit, the "Big Four" auditors supplied a year-end aged accounts receivable trial balance to the internal audit state. Now, three months later, the internal audit team needs to determine subsequent collections on 22,567 patient accounts.

1. State the audit objective in determining subsequent collections, and discuss two functions in which the use of a computer would be helpful to the auditors in meeting that objective. (10)
2. Determine if the hospital is in compliance with the Health Insurance Portability and Accountability Act (HIPAA) of 1996. How do you approach this? (10)

**OR**

2. Examine the role of IT auditor through the process of IT governance and the existing standards of professional practice and their types of auditing. (20)

3. As an IT auditor for the state insurance commission, you have been asked to assist field auditors. The commission's audit team would like to verify the company's total revenue from policy premiums by direct confirmation with policyholders. However, the company's computer records do not show cumulative premiums by customers. The president of the company does not want to use his staff to regenerate this information, stating that their time is valuable. The company retains all transactions for one year on their client/server. Each transaction is recorded in an Access database, one per record, with the customer number being the primary key. There are close to three million records in the file, and backup copies of the record are made in random order and copied to a Zip drive. The insurance company also keeps another Access file that contains the name, address, and customer number for each policyholder. The senior auditor would like you to assist in obtaining the transaction data for a sample of policyholders and preparing the confirmations.

Describe the steps you would take to generate the data and produce the desired confirmations. Use a flow diagram to describe the process. (20)

**OR**

4. Illustrate the following approaches to software development. (20)

1. Traditional IS development,
2. Purchasing and modifying a packaged system,
3. Prototyping and rapid application development (RAD),
4. Less formal end-user development (EUD).

5. Discuss the two major types of destructive devices which are used for both large and small networks under the attack can come to a halt when enduring an e-mail attack. Categorize its four major groups. (20)

**OR**

6. Explain the Information Systems (IS) professionals to consider the different levels of risk associated for the End User Computing application to establish appropriate controls. (20)

7. Estimate the change control procedure for emergency changes with its complexity of hardware, software and application relationships in the operating environment and depict each change which is properly defined, planned, coordinated, tested, and implemented to support an effective IT organization using flowchart. (20)

**OR**

8. Evaluate the functions of risk management to ensure that risk losses do not prevent organization management from seeking its goals of conserving assets and realizing the expected value from investments. (20)

9. What do you know about SAP? Discuss the establishing of security and controls in SAP R/3 with an example. (20)

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**14CS3051 Wireless Sensor Networks**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

- 
1. a) Categorize the issues related to sensors and their communication/ computing architectures for a military application? (10)  
b) Differentiate category 1 WSN and category 2 WSN with examples? (10)

**OR**
  2. Design a wireless sensor network for industrial control applications? (20)
  3. a) For indoor propagation applications, the signal decays much faster than the outdoor propagation applications. True or False? Justify. (*Hint: Justification should clearly specify the contributing factors for signal decay and methodologies for determining the path loss for various parameters*) (8)  
b) Compare IEEE 802.15.1 and IEEE 802.15.4 in terms of i) Range ii) Data throughput iii) Power consumption iv) Battery life v) Size relationship vi) Cost/ Complexity ratio? (12)

**OR**
  4. Differentiate CSMA/CD and CSMA/CA protocols with examples? (20)
  5. For designing an efficient MAC protocol for Wireless sensor Networks, identify and elaborate on its performance requirements? (20)

**OR**
  6. What are hidden node and exposed node problem? How to eliminate these problems? (20)
  7. Write short notes on the following operating systems of WSN. i) Mate ii) OSPM iii) EYES OS iv) TinyOS. (20)

**OR**
  8. Justify how SPIN protocol efficiently disseminates data gathered by individual sensor nodes to all the sensor nodes in the network? (20)
  9. Categorize the network management design issues in Wireless sensor networks? Justify how MANNA provides a better network management architecture? (20)

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**End Semester Examinations - Nov-Dec 2015 Exams**

**Set  
A**

**Time : 3 hrs  
Total Marks: 100**

**14CS3054 Database Security**

1. Examine the physical layout of Oracle database Architecture and describe the major components of Oracle and their interaction with network

1. The Oracle Intelligent Agent (10)

2. Oracle Authentication and Authorization (10)

**OR**

2. How do the PL/SQL procedures to execute SQL Injection over web via Oracle application Server with an example. (20)

3. When Tim first started looking into IBM DB2 security, one of the most frustrating problems he had was simply trying to connect the DB2 client to a remote system. If he had read the documentation the problem wouldn't have been quite so frustrating. Describe how to hook up the client to a remote system through the DB2 processes. (20)

**OR**

4. Explain the steps to determine the authentication of database authorities in view of SYSIBM.SYSDBAUTH table for the following process. (20)

1. DBAUTH
2. TABAUTH
3. ROUTINE AUTH

5. How can logical database architecture be examined with its schemas, tables and views and supports procedures, functions and triggers for the following MySQL database tables. (20)

```
mysql> show tables;
+-----+
| Tables_in_mysql |
+-----+
| columns_priv |
| db |
| func |
| help_category |
| help_keyword |
| help_relation |
| help_topic |
| host |
| tables_priv |
| user |
```

**OR**

6. Discuss the following approaches to hack MySQL database (20)

1. SQL injection in MySQL
2. Known MySQL bugs
3. Trojaning MySQL
4. Dangerous extensions: MYLUA and MYPHP

7. Compute the SQL server to handle the exploits and to determine information about the database using a single-byte UDP query packet sent to the SQL Monitor service on port 1434. (20)

**OR**

8. Apply the steps in building a protected SQL database server installation and ensure by removing the unnecessary features and services to lock down the server. (20)

9. Demonstrate the compromising techniques of a web server or FTP server when an attacker is either client or server on the same network in PostgreSQL database. (20)

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**14CS3056 Internetworking Multimedia**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

- 
1. (i) Explain the various internet service models with suitable diagrams. (10)
- (ii) Explain the various design issues of designing the transport protocols for multimedia systems. (10)
- OR**
2. (i) Discuss RSVP and its message formats with necessary diagrams. (10)
- (ii) Design and explain a network service model which is capable enough to create and maintain communication in multimedia scenario. (10)
3. (i) Explain the Realtime Transport Protocol and its functions. (10)
- (ii) Discuss the multimedia addressing and routing with suitable diagrams. (10)
- OR**
4. (i) A multimedia company gets the contract of conducting a video conference in which the Prime Minister of our country addresses the students in some of the schools. The company wanted to use the Center Based Tree routing mechanisms to transmit the data from the source node to different destination nodes in different schools. Analyze the CBT, SM-PIM and BGMP routing mechanisms and propose an efficient routing mechanism for the company. (12)
- (ii) Store and forward delay is the major delay component in any multimedia data transfer. Propose any two solutions to reduce the store and forward delay in overloaded multimedia networks. (8)
5. (i) Discuss the various compression techniques used in multimedia data transmission. (15)
- (ii) Write short notes on the process of converting an analog signal into digital signal. (5)
- OR**
6. (i) Compare and contrast OSPF and MOSPF. (5)
- (ii) Elaborate the H.261 encoding scheme with suitable block diagram. (15)
7. (i) Explain the use of ISDN to do IP access to Mbone. (15)
- (i) Write short notes on Distributed Virtual Reality. (5)
- OR**
8. (i) Explain the Session Initiation Protocol relay and redirection mechanisms with necessary diagrams. (15)
- (ii) Brief on conference control channel with suitable examples.

(5)

9.

(i) Describe Media On-Demand and its advantages with suitable diagrams.

(10)

(ii) Discuss the various key distribution mechanisms in detail.

(10)

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**End Semester Examinations - Nov-Dec 2015 Exams**

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**14CS3057 Multimedia Database**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

- 
1. a. Explain the role of DBMS in handling multimedia data with suitable queries? Why DBMS cannot handle multimedia data effectively? (12)  
b. Design a general MIRS architecture. Explain and justify your design. (8)
  - OR**
  2. a. Describe the steps to be followed to reconstruct an audio signal from digital signal also explain the different characteristics of audio signal. (15)  
b. Write the steps for encoding the video file associated with audio using MPEG – 1 format. (5)
  3. a. Discuss the various file structures to be used to for automatic text document indexing and Boolean retrieval model. (12)  
b. Elucidate the process of step by step classification method used in the classification of various audio track. (8)
  - OR**
  4. a. Discuss the different approaches to Image Indexing and Retrieval. (12)  
b. Consider there are three images: the first image represents a red car on black background, the second image represents a red car on brown background and the third image represents a blue car on the same brown background, if you use “basic image retrieval technique”, which two images will be considered as similar? How can you improve its performance? (8)
  5. a. What are the criteria for a good shape representation suitable for image indexing and retrieval? (10)  
b. What is a shot in video? What are the ways to prevent false shot detection in video indexing and retrieval? (10)
  - OR**
  6. a. Discuss the basic components of a metasearch engine with a neat diagram. (10)  
b. Describe three r frame selection methods. Compare their strength and weaknesses. (10)
  7. a. Explain the five levels of RAID. Discuss which level is most suitable for multimedia information retrieval applications. (12)  
b. Discuss the advantages and disadvantages of using clustering based retrieval techniques. (8)
  - OR**
  8. a. Why should multimedia database search space reduced? Explain the filtering techniques to reduce the search space. (10)  
b. Assume that you are working as an operating system developer in XYZ Company. The job assigned to you is to design a multimedia operating system. What are the design issues you must take care while designing the multimedia operating system. (10)
  9. a. Discuss the multimedia data management for the web and e-commerce. (15)  
b. What is the role of knowledge management in managing and mining multimedia databases? (5)
-



**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3062 Routing and Switching Techniques**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Write the valid compressed format for the following IPV6 address (10)

2001 : 0000 : 0DB8 : 1111 : 0000 : 0000 : 0000 : 0200

2013 : 0000 : 0123 : 4567 : 89AB : CDEF : 0000 : 0001

0000 : 0000 : 0000 : 0000 : 0000 : 0000 : 0000 : 0001

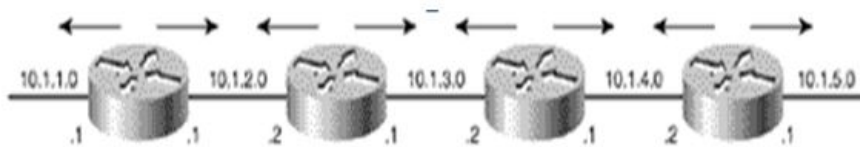
2012 : ABCD : EF01 : 2345 : 0678 : 0910 : AAAA : BBBB

AB1E : 2B00 : 0000 : 1234 : 5678 : 9101 : 1112 : 1113

- b. Explain the three modes of acquiring IPV6 Address

**OR**

2. Configure Static Routing for the following topology



3. Explain the working principle of Link State routing protocol

**OR**

4. a. Explain how metric is calculated in EIGRP (10)

- b. Explain the role of DUAL Algorithm (10)

5. a. Explain how routes are redistributed in Heterogenous environment in Networks (10)

- b. What is the need for Route Filtering (6)

- c. What is an Administrative distance?. Give the administrative distance of any three Routing protocols (4)

**OR**

6. a. What is VLAN?. What are the types of VLAN? (8)

- b. Write the Syntax for configuring VLAN. (8)

- c. What is the need for VLAN in Networks? (4)

7. What is a Transparent Bridge and Explain how it helps to bridge between technologies ? (20)

**OR**

8. Explain the concept of LAN Security

9. Explain various Network Management Strategies



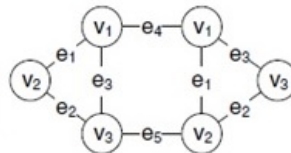
**End Semester Examinations - Nov-Dec 2015 Exams**

**14CS3065 Big Data Analytics**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. What are the different types of data? Discuss the various sources of big data and its applications. (10)  
b. Explain how location-based services can be personalized and offered at low latency by analyzing machine-to-machine data using big data technologies. Give example. (10)
- OR**
2. a. Why does Big Data different from any other data that we have dealt with in the past? Explain the four “V”s that characterize the big data. (10)  
b. Explain the techniques that are used for analyzing unstructured data and Discuss how these techniques are becoming mainstream with their powerful capabilities for organizing, categorizing, and analyzing Big Data.(10)
3. a. In any enterprise, there are likely to be many views of customers and products. Most of the fragmentation comes from divergent views of customers and products. Explain how big data provides a single view of customer / product with an example and a neat diagram. (10)  
b. Discuss the various open source technologies available for big data analytics. (10)
- OR**
4. a. What do you mean by crowd sourcing? Explain crowd sourcing analysis with example. (6)  
b. Describe how the graph mining algorithms which work well in one domain may not work well in another using the following domains (14)
  - Chemical Data
  - Biological Data
  - Computer Networked and Web Data
  - XML Data
5. a. Discuss the distinct features of GraphQL. (6)  
b. Consider the following graph and write the graph motif. Identify the type of operation performed on the graph. Also explain the different operations on graph structures. (14)

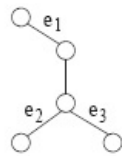


**OR**

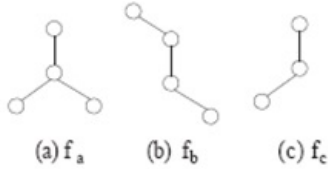
6. a. What is software bug localization? Explain how graph mining algorithm is helpful in software bug localization. (12)  
b. Illustrate the need for a language to query and manipulate graphs with heterogeneous attributes and structures. Give examples for graph-at-a-time queries. (8)
7. a. Give a detailed note on the following (10)
  - Discriminative Structures
  - Closed Frequent Structure



- b. Discuss 'Feature Miss Estimation' method for similarity search and create the edge- feature matrix for the given query graph and the set of features. (10)



A Sample Query



Features

**OR**

8. a. Describe the following node clustering algorithms: (10)

- The minimum cut problem
- Multi-way graph partitioning

- b. Explain the tree based and hierarchical graph indexing techniques. (10)

9. **Compulsory**

- a. Define Cliques. Demonstrate how quasi-cliques are used to determine the massive graphs in the underlying data. Give an example of massive graph. (10)

- b. Discuss the two main classes of conventional techniques, which have been extended to the case of structural objects. (10)

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**14CS3066 IP Telephony**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

1. a. Explain the functional architecture of Signaling System No.7 (SS7) protocol with neat diagram. Compare with OSI layer. (14)

b. Consider a simple telephone network consisting of two end offices and one intermediate switch with a 1-MHz full-duplex trunk between each end office and the intermediate switch. The average telephone is used to make four calls per 8-hour workday, with mean call duration of six minutes. Ten percent of the calls are long distance. What is the maximum number of telephones an end office can support? (6)

**OR**

2. a. What are the various types of satellites used? Describe their functionalities and also explain the concept of routing and localization. (14)

b. Describe the basic differences in functionality between H.323 and Session Initiation Protocol. (6)

3. a. Explain the different real time protocols available for real time data transmission over Internet Protocol. (10)

b. How does Session Initiation Protocol handle call setup and tear down of calls. (10)

**OR**

4. a. Write short notes on the following types of roaming (12)

i. Regional roaming

ii. National roaming

iii. International roaming

b. Illustrate IP multimedia Session establishment with neat diagram. (8)

5. a. Explain the functional architecture of GPRS network with neat diagram. (13)

b. Discuss the advantages and disadvantages of GPRS network. (7)

**OR**

6. Write short notes on the following types of interconnection models (12)

i. Star model

ii. Centralized model

iii. Hybrid model

b. Consider a baseband bus with a number of equally spaced stations with a data rate of 10 Mbps and a bus length of 1 km. (8)

i. What is the mean time to send a frame of 1000 bits to another station, measured from the beginning of transmission to the end of reception? Assume a propagation speed of 200 m/μs.

ii. If two stations begin to transmit at exactly the same time, their packets will interfere with each other. If each transmitting station monitors the bus during transmission, how long before it notices interference?

7. a. Write the differences between symmetric and asymmetric telephony paths in IP routing. (8)

b. Discuss about IP Telephony Administrative Domain and Autonomous System in detail. (12)

**OR**

8.
  - a. Describe about Voice over Internet Protocol interconnection model. (10)
  - b. Describe the functional architecture diagram for Internet Protocol Telephony Administrative Domain (IPTAD). (10)
9.
  - a. Illustrate IP Multimedia Subsystem registration procedure with neat diagram. (5)
  - b. Discuss the advantages and disadvantages of VoIP with traditional phone services. (5)
  - c. Write short notes on the following VoIP protocols (10)
    - i. Bearer Independent Call Protocol
    - ii. Interasterisk Exchange.

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**14CS3071 Pervasive Computing**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

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1. Discuss the various principles of pervasive computing. (20)
- OR**
2. (i) Explain some of the promising applications in Pervasive computing. 7  
(ii) Determine how a generic schema that is applied to Pervasive Information technology meets the global requirements. What information do you need to build the Information Technology in pervasive environment? 13
3. (i) Determine the working of smart appliances with examples. 10  
(ii) How does Pervasive Computing play a role in Automotive computing. 10
- OR**
4. (i) Write Short notes on: 10  
Communication and Networking in Palm Operating System  
(ii) Why Smart card effective while compare with bar code? What does makes is it better to have smart labels for smart appliances in pervasive computing technology? 10
5. Explain how pervasive device internet connection can be achieved. Identify suitable architecture for Wireless Application Protocol and elaborate various Layers in WAP1.1. 20
- OR**
6. With neat Sketch explain the GSM Architecture and the following GSM subsystem Entities:  
(a) Mobile Station showing the GSM Reference Model, Classification of MS based on power, Types of MS's and explain International Mobile Equipment identity (IMEI), International Mobile Subscriber identity (IMSI), SIM (Subscriber Identity Module).  
(b) Base Station Subsystem.  
(c) Operation & Maintenance Subsystem (OMSS). (20)
7. (i) What is Gateway? Discuss in details the Wireless Gateway and its types. 8  
(ii) What is Synchronization? List out various challenges deals with synchronization? Write short notes on SyncML. 12
- OR**
8. (i) What is the need for transcoding? Explain about Internet content transcoder. 10  
(ii) Elaborate the design of middleware database components with neat block diagram. 10
9. (i) Write short notes on 10  
(a) System View  
(b) Communication Services on Home Services  
(ii) Discuss the home automation and energy services. 10
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**14CS3073 Web Security**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

1. a) Detail public key algorithms in cryptography. (10)  
b) Explain various privacy protection techniques to ensure user privacy. (10)

**OR**

2. a) Explain the various attacks on symmetric key algorithms. (10)  
b) What are the attacks commonly used when encryption algorithm is known? Write four techniques used by an attacker. (10)

3. a) Detail Password, Digital Signature and Biometric based digital identification techniques used in security. (10)  
b) Describe the public key infrastructure in digital identification technique. (10)

**OR**

4. a) What is meant by password sniffing? How can we protect remote access and content updating against password sniffing? (8)  
b) Describe the tools used by attackers to compromise host system. (5)  
c) How can you set the best password for your account? What are the things to be avoided when picking up the passwords? (7)

5. a) Explain the various techniques used to protect your e-mail address. (10)  
b) In 1991, a car salesman from New York named Steven received the credit report instead of a journalist in Washington named Stephen. Once Steven in New York had Social Security Number and a credit report, he had stolen the journalist's personal details and misused the credit card details for shopping and other expenses. What type of theft is it? Give various solutions to address this problem. (10)

**OR**

6. a) Explain the risks of code downloaded from internet. (8)  
b) Differentiate Active-X controls from Plug-ins. (7)  
c) Discuss Card shark, David.exe and the Chaos Quicken checkout worms. (5)

7. a) Why backup is more important? Describe the different forms of backup available today. (10)  
b) Ponemon Institute conducted a survey on laptop theft at airports. Survey results showed that nearly 640,000 laptops are lost every year. Two thirds of the lost laptops are never returned to their owners. Worse yet, slightly more than half of the lost laptops held confidential data, and only 42 percent of the lost laptops have been backed up. Give solutions to protect laptop from stealing at airports. (10)

**OR**

8. a) Describe filtering software and censorship. (12)  
b) What is meant by copyright? Describe the different kinds of infringement in copyright. (8)
9. a) Can we restrict access to web server based on IP address and DNS? Justify your answer. (10)  
b) Describe the way to restrict access to HTML files and CGI scripts that runs on web server. (10)

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**14CS3075 Wireless Security**

**Set A**

**Time : 3 hrs**  
**Total Marks: 100**

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1.           a. Explain the various types of attackers in the wireless network? (12)  
              b. Describe the traditional security architecture with the block diagram. (8)
  - OR**
  2.           a. What are the dangers encountered by passive monitoring in wireless network. (4)  
              b. Discuss man in the middle attack and snooping attack (16)
  3.           a. Explain the various layers of IEEE 802.11 protocol. (10)  
              b. Describe the basics of operations of infrastructure mode in IEEE 802.11 protocol. (10)
  - OR**
  4.           a. Discuss the usage of RC4 algorithm in Wi-fi local area networks (10)  
              b. Explain the relationship between wireless fidelity network and IEEE 802.11. (10)
  5.           a. Draw the organizational diagram of typical dial in network. (3)  
              b. Describe the role of IEEE 802.1x in a simple switched hub environment (5)  
              c. i. Mention the difference between dial in networks and IEEE 802.1X (2)  
                  ii. List out the various uses of remote access dial in user service in WPA and RSN network (3)  
              d. Explain the authentication exchange using extensible authentication protocol over RADIUS (7)
  - OR**
  6.           a. Discuss the role of handshaking protocol in transport layer security. (6)  
              b. Elucidate the steps of recognition of client by server through extensible authentication protocol start up method (8)  
              c. Explain the process of ticket granting service in issuing tickets to various machines in Kerberos method (4)  
              d. List out the problems encountered by Kerberos method (2)
  7.           a. Draw the block diagram of pairwise and group key. (2)  
              b. Discuss the ways of computing the temporal keys in wireless personal area key hierarchy (8)  
              c. Mention the difference between MAC service data unit and MAC protocol data unit (3)  
              d. List out the weakness of wireless ethernet protocol over wireless network. Mention the key features where the changes required for WEP (7)
  - OR**
  8.           a. Mention the two barriers to the growth of public wi-fi lan network (2)  
              b. Discuss the security issues in public hotspot. (8)  
              c. Explain the different types of hotspot. (10)
  9.           a. Draw the Bluetooth security architecture. (2)

- b. Explain the security threat to bluetooth? And discuss Bluetooth hole. (10)
- c. Discuss the high level attacker process with the block diagram (8)

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**14CS3076 Cyber Forensics**

**Set B**

**Time : 3 hrs**  
**Total Marks: 100**

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1.           a) What are the different kinds of cybercrimes? (10 Marks)  
              b) What are the different types of digital evidence sources? (10 Marks)
  - OR**
  2.           Elucidate the importance of Electronic surveillance in forensic computing.
  3.           a) Write and explain the various techniques of hacking? (10 Marks)  
              b) Explain about Cyber Moneylaundering. (10 marks)
  - OR**
  4.           a) What are the impacts of mobile on human health? (10 Marks)  
              b) List and explain the common crimes related to mobile phones. (10 Marks)
  5.           a) What is the importance of Internet security? (10 marks)  
              b) Write and explain the major concerns of computer and internet security. (10 Marks)
  - OR**
  6.           While doing computer forensic analysis, how to handle the issues related to ISP and hosting provider and hearsay evidence?
  7.           What are the different necessary actions required for investigative incident-response? Explain.
  - OR**
  8.           Explain the different features available in New technologies safeback bit-stream backup tool.
  9.           Explain the various major sections found in the nondisclosure agreement.

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