

# MCA-II Principles & Practices of Management

May, 2006

CCN/2014-06.

BB-6922

( 3 Hours )

[ Total Marks : 100

- N.B. :
- (1) Question No.1 is compulsory.
  - (2) Attempt any four questions from the remaining six questions.
  - (3) All questions carry equal marks.

Q.1 a) "F. W Taylor suggested rationalizing work for greater labour productivity while Elton Mayo recommended humanizing work for enhanced efficiency and personal satisfaction." Discuss. 12

b) Write short note on. 08

- i) Work study
- ii) Materials Management
- iii) Quality Circles

Q.2 a) Explain following approaches to management in detail. 10

- i) System approach
- ii) Contingency Approach

b) Explain the concept of Management By Objectives with its process, advantages and disadvantages. 10

Q.3 a) What is organization structure? Explain Matrix Organization with examples, advantages and disadvantages. 10

b) What is delegation of authority? Explain principles of delegation of authority. 10

Q.4 a) Explain following two theories of Motivation. 12

- i) Theory X & Theory Y
- ii) Herzberg's Two factor Theory

b) Define Leadership. Also explain characteristics of good leader. 08

Q.5 a) What is Marketing Research? What is the need & factors affecting Marketing Research? 12

b) What is new product development? Explain steps in new product development. 08

Q.6 a) What is Production Planning and control? Explain its functions. 08

b) Explain system approach in organization. Also explain different types of production systems. 12

Q.7 a) What is financial analysis? Explain the following. 12

- i) Cash flow analysis
- ii) Fund flow analysis
- iii) Ratio analysis

b) Define multinational firm. What are the ways through which a multinational firm can organize its activities? 08

# MCA Sem. II System Analysis Design & Implementation

May, 2006

C-221 / atH06-pra 5

Con. 1686-06.

BB-6915

(3 Hours)

[ Total Marks : 100

- N.B. (1) Question No. 1 is compulsory.  
 (2) Answer any four out of remaining six questions.  
 (3) Figures to the right indicate marks.  
 (4) Answer to questions should be grouped and written together i.e. all answer to sub-questions of individual question like Q. Nos. 1, 2, 3 etc. should be answered one below the other.

- Q. 1 (a) Built Railway Reservation System. Draw context level diagram, DFD up to two level, ER diagram, draw input, output screen. (15)  
 (b) How data dictionary can be used during software development? (5)
- Q. 2 (a) Under what circumstances of for what purposes would one use an interview rather than other data collection methods? Explain (12)  
 (b) Describe steps in SDLC model with an example. (8)
- Q. 3 (a) What are CASE tools? Explain some CASE tools used for prototyping. (10)  
 (b) what is cost/ benefit analysis? Describe any two methods of performing the same. (10)
- Q. 4 (a) Write a detailed note about the different levels and methods of testing software. (10)  
 (b) Explain the concept of Normalization with examples. Why would you denormalize? (10)
- Q. 5 (a) What are structured walkthroughs & how are they carried out? Describe the composition of walkthrough team. (10)  
 (b) What is user interface design? what tools is used to chart a User interface Design. (10)
- Q. 6 (a) Describe the different methods of file organization. Illustrate with examples, for what type of systems, which type of file organization methods can be used. (12)  
 (b) What is mean by prototype? What is its use in application prototyping. (08)
- Q. 7 (a) Distinguish between reliability & validity . how are they related? (08)  
 (b) Write short note on :- (12)  
       (i) Structure Charts (ii) HIPO charts  
       (iii) Security and Disaster Recovery. (iv) List Of Deliverables..

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# MCA Sem. II Advanced Data & File Structure

May, 2006

Con. 1691-06.

BB-6918

(3 Hours)

[ Total Marks : 100

- N.B.** (1) Question No. 1 is compulsory.  
 (2) Attempt any four from question Nos. 2 to 7.  
 (3) Assume suitable data wherever required.  
 (4) State your assumptions clearly.  
 (5) Answers to sub questions of any individual questions should be written together.  
 (6) Use of pencil should be done only to draw diagrams and graphs.  
 (7) Figures to the right indicate marks.

1. (a) Define binary search tree. Write a pseudo code for inserting an element in binary search tree. 10  
 (b) Find the Huffman's code for each of the following characters. 10

A	B	C	D	E	F
45	13	12	16	9	5

Write the pseudo code for the same.

2. (a) What is hashing? Explain the terms synonyms, collision and home address. Using modulo-division and linear probing method, store the keys given below in an array of 13 elements. How many collisions occurred? 10

28	7	846
786	431	870
612	675	876
546	34	12

- (b) Explain the need for balancing binary search tree. Explain with suitable example the concept and construction of balanced AVL trees. 10

- (a) Describe in detail Indexed Sequential Access Method. 10  
 (b) Write an algorithm for sorting the elements using shell sort. An array contains the elements shown below. Show the contents of the array after it has gone through a one-increment pass of the shell sort. The increment factor is  $k = 3$ . 10

23 3 7 13 89 7 66 2 6 44 18 90 98 57

4. (a) (i) Define m-way trees. How are B and B+ trees used to maintain indexes? 5  
 (ii) Build a B-tree of order 4 by inserting the following data in the sequence given below: 5

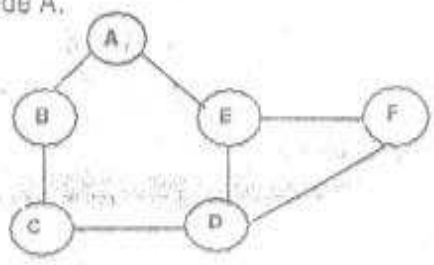
92 24 6 7 11 8 22 4 5 16 19 20 78

- (b) With a suitable example explain with steps to find the path matrix using Warshall's Algorithm. 10

5. (a) Create a binary search tree of the following data entered as a sequential set 10

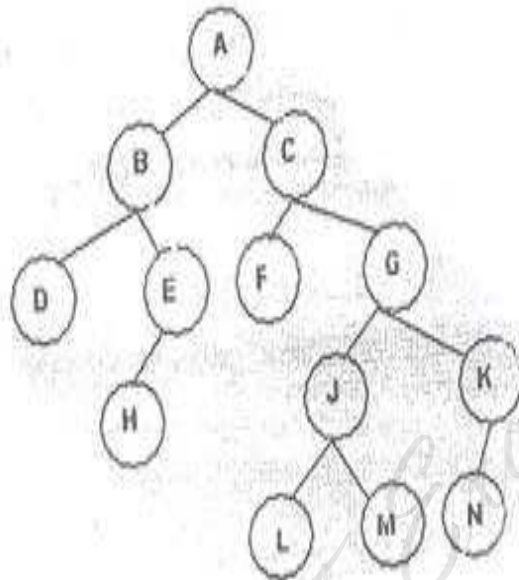
14 23 7 10 33 56 80 66 70

- (b) Write an algorithm for depth first traversal of a graph. Traverse the following graph using breath first and depth first approach from node A. 10





6. (a) Explain preorder, inorder and post order traversal of a tree. Give the preorder, inorder and post order listing of the nodes of the following : 10



- (b) Write a short notes on any two of the following :— 10
- (i) Multilist File Organization
  - (ii) Quick Sort
  - (iii) Relative File Organization.

7. (a) What is a spanning tree ? What is a minimum spanning tree ? Write an algorithm to find the minimum spanning tree. 10
- (b) An array contains the elements shown below. Using the binary search algorithm, trace the steps followed to find 88. At each loop iteration including the last, show the contents of the first, last and mid. 10

8 13 17 26 44 56 88 97

## Combinatorics & Probabilities

- N.B.** (1) Question No. 1 is compulsory.  
 (2) Attempt any four out of remaining six questions in which two questions should be from Question Nos. 2 to 4 and remaining two questions from Question Nos. 5 to 7.  
 (3) Assume any necessary data but justify the same.  
 (4) Figures to the right indicate marks.  
 (5) Use of calculator is allowed.

1. a) (i) Use the method of homogeneous solution; and particular solution to solve  $a_n = 200a_{n-1} - 100$  with initial condition  $a_0 = 1$ . [5]

(ii) The solution of the recurrence relation  $C_0 a_n + C_1 a_{n-1} + C_2 a_{n-2} = f(n)$  is  $2^n + 3^3 + 5$ . Given that  $f(n)=40$  for all  $n$ . Determine  $C_0, C_1, C_2$ . [5]

b) A binary communication channel carries data as one of two types of signals denoted by 0 and 1. Owing to noise, a transmitted 0 is sometimes received as 1 and a transmitted 1 is sometimes received as 0. For a given channel, assume a probability of 0.94 that a transmitted 0 is correctly received as a 0 and a probability of 0.91 that a transmitted 1 is correctly received as a 1. Further assume a probability of 0.45 of transferring a 0. If a signal is sent, determine: [10]

- (i) Probability that a 1 is received.
- (ii) Probability that a 0 is received.
- (iii) Probability that a 1 was transmitted, given that 1 was received.
- (iv) Probability that 0 was transmitted, given that 0 was received.
- (v) Probability of an error.

2. a) The joint probability density function of the two dimensional random variable (X,Y) is given by

$$f(x,y) = \begin{cases} \frac{8}{9}xy, & 1 \leq x \leq y \leq 2 \\ 0, & \text{otherwise} \end{cases}$$

- (i) Find the marginal densities of X and Y. [5]
- (ii) Find the conditional density function of Y given X=x, and the conditional density function of X given Y=y. [5]

b) (i) A bag contains 2 red, 5 white and 8 blue balls. Two balls are drawn at random from it. What is the probability that one is white and other is blue? [5]

(ii) Let X be a random variable for which  $E(X)=10$  and  $V(X)=25$ . Find the values of a and b such that  $Y=aX-b$  has expectation zero and variance 1. [5]

3. a) (i) An inspection plan calls for inspecting five chips and for either accepting each chip, rejecting each chip, or submitting it for reinspection, with probabilities of  $p_1=0.70$ ,  $p_2=0.20$ ,  $p_3=0.10$  respectively. What is the probability that at least one of the chips must be reinspected? [5]

(ii) State and prove Baye's Theorem on probability. [5]

b) (i) X and Y are two random variables having joint density function

$$f(x,y) = \frac{1}{27}(2x+y),$$

where x and y can assume only integer values 0,1 and 2. Find the conditional distribution of Y for X=x. [5]

(ii) A and B play a game in which their chances of winning are in the ratio 3:2. Find A's chance of winning at least three games out of five games played. [5]

[ TURN OVER



4. a) (i) The number of jobs arriving at a computer center between 9am and 10 am is a random variable  $X$  with a Poisson distribution with mean 2. The number of jobs arriving between 10 am and 11 am is a random variable  $Y$  with Poisson distribution with mean 6. If  $X$  and  $Y$  are independent, find the probability that more than 5 jobs will arrive between 9 am and 11 am. [5]

(ii) If  $X$  and  $Y$  are independent random variates following  $N(8,4)$  and  $N(12,48)$  respectively, find the value of  $\lambda$  such that

$$P(2X - Y \leq 2\lambda) = P(X + 2Y \geq \lambda) \quad [5]$$

Where  $N$  follow normal distribution with parameters  $\mu$  and  $\sigma^2$  is denoted by  $N(\mu, \sigma^2)$ .

b) (i) Prove that exponential distribution is memoryless. [5]

(ii) A chord is taken at random in a circle. What is the chance that its length, 'l' is not less than 'a', radius of the circle? [5]

5. a) What is the solution of the recurrence relation  $a_n = 6a_{n-1} - 9a_{n-2}$ , with initial condition  $a_0 = 1, a_1 = 6$ . [5]

(ii) Let  $a_n = \begin{cases} 0 & 0 \leq n \leq 2 \\ 2^{-n} + 3 & n \geq 3 \end{cases}$  Find  $\nabla a_n$ . [5]

b) (i) There are 4 copies of books on operating systems, 3 copies of another book on Java, and 3 copies of a third book on Visual Basic. Find the different number of ways in which they can be arranged in a line on a shelf? How many of these arrangements will have two books on Virtual Basic at two ends? [5]

(ii) Give a formula for the coefficient of  $x^k$  in the expansion of

$$\left(x^2 - \frac{1}{x}\right)^{100} \quad [5]$$

6. a) (i) Use the generating functions to solve the recurrence relation  $a_n = 7a_{n-1}$ , with the initial condition  $a_0 = 5$ . [5]

(ii) If  $m, n$ , and  $r$  are nonnegative integers with  $r$  not exceeding either  $m$  or  $n$ . Then, using combinatorial arguments, prove that

$$\binom{m+n}{r} = \sum_{k=0}^r \binom{m}{r-k} \binom{n}{k} \quad [5]$$

b) (i) An electronics shop has eight different varieties of mobile phones. How many ways are there to choose 12 mobile phones. [5]

(ii) Find the number of permutations of the letters in the word 'INSTITUTE' when letters are taken all at a time. [5]

7. a) (i) Each user on a computer system has a password which is six to eight characters long, where each character is an uppercase letter or a digit. Find the maximum number of possible passwords. [5]

(ii) Prove that  $\binom{n}{0} + \binom{n}{2} + \binom{n}{4} + \dots = \binom{n}{1} + \binom{n}{3} + \binom{n}{5} + \dots = 2^{n-1}$  [5]

b) (i) Find the number of solutions of the equation  $e_1 + e_2 + e_3 = 17$  if  $e_1, e_2, e_3$  are non-negative integers with  $2 \leq e_1 \leq 5, 3 \leq e_2 \leq 6, 4 \leq e_3 \leq 7$ . [5]

(ii) Six letters are taken from envelopes read and replaced back in the envelopes at random. In how many ways can this be done so that (1) no letter is in the correct envelope? (2) at least two letters are in the correct envelope. [5]



- N.B.** (1) Q. No. 1 is compulsory.  
 (2) Attempt any four of remaining six questions.

1. a) Consider the following set of processes, with the length of the CPU burst time given in milliseconds:

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub>, P<sub>4</sub>, and P<sub>5</sub> all at time 0.

1. Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a nonpreemptive priority (a smaller priority number implies a higher priority) and RR (quantum=1) scheduling.
    2. What is the turnaround time of each process for each of the scheduling algorithms in part 1.
    3. What is the waiting time of each process for each of the scheduling algorithms in part 1. 10
  - b) What are the main functions of Operating System? 5
  - c) Explain Clock hardware & software in I/O Systems. 5
2. a) What are the criteria of CPU scheduling? What are the contents of Process Control Block? 10
  - b) Explain semaphores, binary semaphores, counting semaphores & critical region. How is it help in achieving Mutual Exclusion? 10
3. a) What is thread? Explain various types of threads. 10
  - b) What is External & Internal fragmentation? And discuss the techniques to overcome fragmentation? 10
4. a) What are the necessary & sufficient conditions for Deadlock to occur? Explain. 10
  - b) Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB and 600 KB (in order), how would each of the first-fit, best-fit and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB and 426 KB (in order)? Which algorithm makes the most efficient use of memory. 10
5. a) What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem. 10
  - b) Explain the elevator algorithm for scheduling disk requests. 10
6. a) Why security is required? Explain different ways of security. 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, assuming seven frames? Remember that all frames are initially empty, so your first unique pages will all cost one fault each.
    1. LRU replacement
    2. FIFO replacement
    3. Optimal replacement. 10
7. Write short notes on any four: 20
    - a) Monitors
    - b) UNIX Operating System
    - c) RAM Disk
    - d) Direct Memory Access
    - e) Spooling
    - f) Terminals.



30th Oct. 2006

MCA Sem II System Analysis Design & Implement.

Con.4272-06.

BB-3883

( 3 Hours )

[ Total Marks : 100

- N.B. (1) Q. No. 1 is compulsory.  
 (2) Answer any four questions out of remaining six question.  
 (3) Figures to be right indicated marks.

- 1.A) Built a current Admission for MCA system . Draw context level diagram, DFD upto two level, ER diagram, with Input , output Screen along with data dictionary. 15
- B) Define data structure . What are major types of data structure. 05
- 2.A) What cost elements are considered in the cost/benefit analysis ? which do you think is most difficult to estimate to estimate ? why? 10
- B) Discuss the Six Special System test. Give examples. 10
- 3.A) Describe the concept & procedure used in the constructing DFD's . Using and example of your own to illustrate. 10
- B) What is normalization ? What is purpose of normalization, illustrate the method of normalization of database. 10
- 4.A) What are the major threads of system Security. Which is one of most serious. 08
- B) What are the requirement of good system Analyst 12
- 5.A) What are CASE tools . Explain same case tolls used for prototyping. 10
- B) What is difference between system analysis & system design. How does the focus of information system analysis is differ from information system design. 10
- 6.A) What are the structural walkthroughs and how are they carried out? Describe the composition of a walkthrough team. 10
- B) Under what circumstances or for what purpose would one use an interview rather than other data collection methods? Explain. 10
7. Write a short note on : 20
- a) HIPO chart
  - b) Warnier orr Diagram
  - c) List of deliverables.
  - d) SDLC.

MCA26



N.B. :

- (1) Question No. 1 is compulsory.
- (2) Attempt any four out of remaining six questions in which two questions should be from Question No.2 to Question No. 4 and remaining two questions from Question Nos. 5 to 7.
- (3) Assume any necessary data but justify the same.
- (4) Figures to the right indicate marks.
- (5) Use of calculator is allowed.

1. (i) Give the recurrence relation and initial conditions to find the maximum number of regions defined by  $n$  lines in a plane. Assume that the lines are not parallel and lines not intersecting at one point,  $n > 2$ . [5]

(ii) Solve the recurrence relation  $a_n = a_{n-1} + a_{n-2}$  with initial conditions.  $a_0 = 1$  and  $a_1 = 1$ . [5]

(b) (i) State and prove Bayes theorem on probability. [5]

(ii) Out of 100 jobs received at a computer center, 50 are of class 1, 30 of class 2, and 20 of class 3. A sample of 30 jobs is taken with replacement. Find the probability that the sample will contain ten jobs of each class. Also find the probability that there will be exactly twelve jobs of class 2. [5]

2. (a) Given the following bivariate probability distribution obtain Marginal distribution of  $X$  and  $Y$  and the conditional distributions of  $X$  given  $Y=2$ . [10]

X \ Y	-1	0	1
0	1/15	2/15	1/15
1	3/15	2/15	1/15
2	2/15	1/15	2/15

(b) (i) Let  $A$  and  $B$  be two events with  $P(A) = \frac{3}{8}$ ,  $P(B) = \frac{5}{8}$  and  $P(A \cup B) = \frac{3}{4}$ . Find  $P(A/B)$  and  $P(B/A)$ . [5]

(ii) A coin is tossed until a head appears. What is the expectation of the number of tosses required? [5]

3. (a) (i) Consider discrete random variables  $X$  and  $Y$  with the joint probability mass function as below. [5]

Y \ X	-1	0	1
-2	1/16	1/16	1/16
-1	1/8	1/16	1/8
1	1/8	1/16	1/8
2	1/16	1/16	1/16

Are  $X$  and  $Y$  independent? Are they un-correlated?

(ii) Ten balls are distributed at random among 4 boxes. What is the probability that first box will contain 4 balls. [5]

(b) (i) A random variable  $X$  takes the values 1, 2, 3 and 4 such that  $4P(X=1)=2P(X=2)=3P(X=3)=P(X=4)$ , [5]  
find the probability distribution and cumulative distribution function of  $X$ .

(ii) In a binomial distribution consisting of 5 independent trials, probability of 1 and 2 successes are 0.4096 and 0.2048 respectively. Find the parameter 'p' of the distribution. [5]

4. (a) (i) Prove that mean and mode of a normal distribution are equal. [5]

(ii) If  $X$  is the Poisson variate such that  $P(X=2) = 9P(X=4)+90P(X=6)$ . Find mean of  $X$ . [5]

(b) (i) Prove that exponential distribution is memoryless. [5]

(ii) If  $X$  has a uniform distribution in  $[0,1]$ , find the distribution (pdf) of  $-2 \log X$ . Identify the distribution. [5]

5 (a) (i) Use the generating functions to solve the recurrence relation  $a_k=5a_{k-1}-6a_{k-2}$ ,  $k \geq 2$ , with the initial condition  $a_0=6$   $a_1=30$ . [5]

(ii) Find  $\nabla a_n$  where (a)  $a_n=5$ , (b)  $a_n=7n-4$ , (c)  $a_n=5n^2-n+2$  Given that  $\nabla$  denotes the backward difference. [5]

(b) (i) Find the particular solution of  $a_r-5a_{r-1}+6a_{r-2}=1$ . [5]

(ii) Using combinatorial arguments, prove that  $P(n,r) = \frac{n!}{(n-r)!}$ . [5]

6. (a) (i) How many solutions does the equation  $x_1+x_2+x_3=11$  have, if  $x_1, x_2, x_3$  are non-negative integers. [5]

(ii) Find the number of integers between 1 and 250 that are not divisible by 2 nor by 7 but divisible by 5. [5]

(b) (i) A string containing only 0's, 1's and 2's is called a ternary string. How many ternary strings of length 7 either starts with one bit "2" or end with two bits "11"? [5]

(ii) Verify the Vandermonde's Identity for  $r=2, m=2, n=2$ .

$$\binom{m+n}{r} = \sum_{k=0}^r \binom{m}{r-k} \binom{n}{k} \quad [5]$$

7. (a) (i) What is the coefficient of  $x^{15}y^{21}$  in the expansion of  $(2x-5y)^{36}$ ? [5]

(ii) A fruit shop has eight different varieties of mangoes viz  $M_1, M_2, \dots, M_8$ . How many ways are there to choose a dozen mangoes with at least three of "variety  $M_2$ " and no more than two of "variety  $M_4$ "? [5]

(b) (i) In how many ways can three 0's, three 1's and three 2's be arranged so that no three adjacent digits are the same in an arrangement? [5]

(ii) Prove that number of derangements of  $n$  symbols is given by [5]

$$d_n = n! \left[ 1 - \frac{1}{1!} + \frac{1}{2!} - \dots + (-1)^n \frac{1}{n!} \right]$$



MCA. Sem-II sub. → Principles & Practices of Management

Con.4270-06.

BB-3895

( 3 Hours )

[ Total Marks : 100

- N.B. (1) Q. No. 1 is compulsory.  
 (2) Answer any four questions from remaining six questions.  
 (3) All questions carry equal marks.
1. (a) Give brief history of management thought before the twentieth century. 10  
 What do you understand by scientific management school of thought ?  
 (b) Define Inventory Management ? Why inventory is considered as an important function of production planning and control ? 10
  2. (a) Define Management. Explain primary and supportive functions of Management. Also explain principles of management. 12  
 (b) Write short notes on (any two) :- 8  
     (i) Contributions of Elton Mayo.  
     (ii) Missions and Objectives.  
     (iii) Strategic Planning.
  3. (a) Define Leadership. Explain various types of leadership styles. 10  
 (b) Define Quality Management System (QMS). Explain the concept of TQM with philosophy and principles. 10
  4. (a) Define product life cycle and product life cycle management. 12  
 Explain why product life cycle management has become an important marketing management function in ICT companies in these days.  
 (b) What is meant by performance appraisal ? Explain various methods of performance appraisal. 8
  5. (a) Explain Black and Mouton's theory of leadership in detail. Also state its advantages and disadvantages. 8  
 (b) Write short notes on (any three) :- 12  
     (i) Role of Communication in IT industries.  
     (ii) Douglas McGregor's theory of motivation.  
     (iii) SWOT Analysis.  
     (iv) Incentive System.
  6. (a) Distinguish between power and authority. Authority and responsibility goes hand in hand together. Explain. 8  
 (b) Explain organization structure. Draw organization chart for a medium scale IT Company with annual sales turnover of 200 million dollar and explain functions of employees at different levels. 12
  7. (a) What is meant by working capital management ? Explain the role and importance of working capital analysis. 10  
 (b) Discuss any two strategies/methods for a firm to enter a foreign market. 10

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- Note: 1) Question No. 1 is compulsory.  
 2) Answer any four from remaining six.  
 3) All questions carry equal marks.

Q.1 A) A binary tree has 10 nodes. The inorder and preorder traversal of the tree are shown below. Draw the tree alongwith its postorder traversal. (10)

Preorder: JCB ADEFGH I

Inorder: ABCEDFJGIH

B) Given the set of symbols and corresponding frequency table as below, explain the steps to find Huffman Code. (10)

Symbol	A	B	C	D	E	F	G	H
Frequency	22	5	11	19	2	11	25	5

Q.2 A) Explain Insertion and Deletion in General Tree (6)

B) What is hashing? Describe any 3 techniques for collision resolution. (8)

C) Write the pseudocode for Rotate AVL tree right. (6)

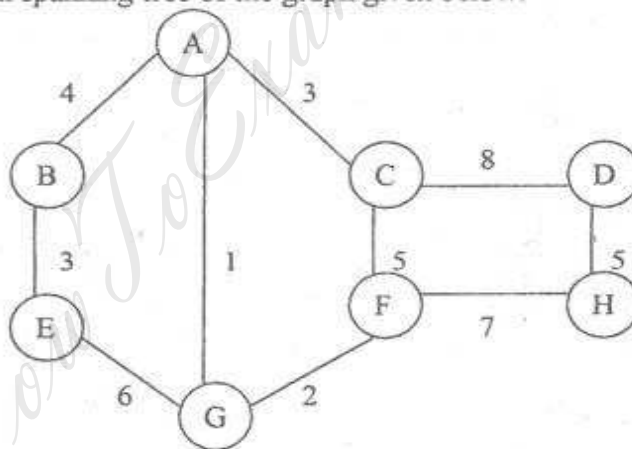
Q.3 A) Explain the concept of creation, insertion and deletion in B-tree using suitable examples. (12)

B) What is Direct File Organisation? Discuss overflow handling in direct File Organisation. (8)

Q.4 A) What is Heap? Write algorithms for: (12)

- i) Building a heap ii) Delete a heap

B) Find the minimum spanning tree of the graph given below: (8)



Q.5 Differentiate between: (20)

- i) Relative File organization and Indexed Sequential File Organization
- ii) Directed and Undirected Graphs
- iii) General Tree and Binary Tree
- iv) Depth First and Breadth-First Traversal

Q.6 A) Consider the following set of 10 numbers: (12)

85, 36, 87, 10, 91, 18, 15, 52, 73, 49

Sort the array using:

i) Insertion Sort

ii) Quick Sort

Also find out the complexity for each algorithm in best and worst case.

B) Explain with suitable example Warshall's algorithm. (8)

Q.7 Write short notes on: (20)

- i) B\*- tree
- ii) Multi-key Organisation
- iii) Modulo-division hashing
- iv) Sequential Access mode



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