M.C.A. (SEM - II)

DATA STRUCTURES

(NOV-18)

[Time: 3 Hours]   [Marks: 100]

Please check whether you have got the right question paper.

N.B: 1) Question No. 1 is compulsory.
       2) Attempt any four questions out of remaining six questions.

Q1(A)   Explain the different method of sorting techniques used in data structure   **[10]**

Q1(B)   Given the set of symbols and corresponding frequency table as below, explain the steps   **[10]**
        to find Huffman Code

Symbol	A	E	C	F	B	G	D	H
Frequency	12	65	23	11	55	21	45	90

Q2(A)   Explain collision resolution and its techniques in context of hashing.   **[10]**

Q2(B)   Define the efficiency of an algorithm. Explain the process of analysis of an algorithm as   **[10]**
        well as   the notations used (Big O,θ, Ω Notation)

Q3(A)   What is sorting? Sort the following elements using selection sort method   **[10]**

        22, 12, 32, 2, 15, 25, 10. 12

        Also give the algorithm and efficiency for the same.

Q3(B)   Define an expression tree. For the following infix expression, draw the expression tree   **[10]**
        and find prefix and postfix expression.

         A*B/(C-D)+E*(G-S)

Q4(A)   What is AVL Tree? Explain the detail   **[10]**

Q4(B)   What is heap? Write an algorithm for ReheapUp.   **[10]**
        Construct a Max heap for the following data values arriving in sequence

         25, 13, 52, 10, 14, 29, 22, 41, 92, 31.

Q5(A)   What is a Binary Search Tree (BST)? Write an algorithm to   **[10]**
        i)   Insert a node in BST
        ii)   Find the smallest node in the BST

Q5(B)   Write short note on (any two)   **[10]**
             i)   Doubly linked list
             ii)   Dijkstra's algorithm
             iii)   General trees

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Q6(A)   What is hashing? Explain the method of hashing with suitable example   **[10]**

Q6(B)   What is minimum spanning tree? Write Prim's algorithm to find minimum spanning   **[10]**
          tree and determine minimum spanning tree of the following graph
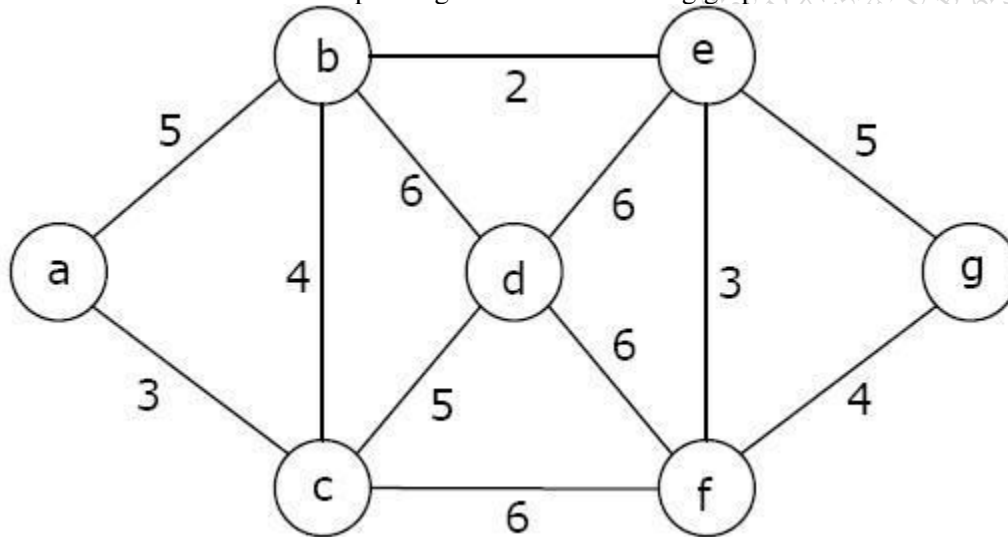
Q7(A)   Define M-way trees. Construct a B-Tree of order 3 by inserting numbers from 1 to 10.   **[10]**

Q7(B)   Explain the Stack with Push Pop operation algorithm implementation

[10]

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M.C.A. (SEM - II)
OPERATING SYSTEMS
(NOV-18)

Time: 3 Hrs

NOTE:
    I.   Question No. 1 is **Compulsory**.
    II.   Attempt any four out of remaining six
    III.   Elaborate each answer with the help of an **example**

1. **(A)** Consider the following process arrival times, and run time requirements: **10**

Process Name	Arrival Time	Processing Time
A	0	5
B	1	3
C	2	8
D	3	6

For the process listed in the above table, draw a Gantt chart and Find their Average waiting time and Average turnaround time using:-
1) FCFS, 2) SJF (Preemptive and Non-Preemptive).
3)Round Robin (quantum=2)

  (B) What is thread? Explain are user level threads and Kernel level threads?   **10**

2. **(A)** What is Deadlock? Explain the methods for Deadlock Prevention?   **10**
  (B) What is Linux Operating System? What is shell? What are the Different types   **10**
        Of shells in Linux?

3. **(A)** Consider the following snapshot of the system:-   **10**

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

Using Bankers Algorithm.
I) What is the contents of matrix need?
II) Is the system in safe state? Give the sequence.
III) Is the request from P1 arrives for (1, 0, 2), can be the request be granted immediately?

  (B) Draw a diagram for Five State Process model and Explain each state transition in it.   **10**

4. **(A)** Differentiate between fixed partitioning and dynamic partitioning.   **10**
  (B) What is virtual memory? Explain in brief translation look aside table.   **10**

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5. (A) What is Operating System? what are the various services provided by Operating **10**
System

(B) Given the disk has 200 (0 – 199) cylinders. Suppose the disk queue contains the **10**
request for I/O to blocks on the cylinder in the following order:-
95,180,34,119,11,123,62,64
What is the Total head movement for the following algorithm?
(I)SSTF (II)SCAN (III)CSAN (IV)LOOK

6. (A) Consider the pages are referenced in the following sequence. **10**
1,2,6,12,0,0 page size is 100.
How many page faults will occur for the following page replacement algorithm,
assuming three frames?
I)LRU replacement
II)FIFO replacement
III) Optimal replacement.

(B) Explain different types of process scheduling **10**

7. Write short notes on any four: **20**

(A) Android OS.
(B) Compiler.
(C) Assembler.
(D) Thrashing.
(E) Segmentation.
(F) Semaphore.

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M.C.A. (SEM - II)
FINANCIAL MANAGEMENT
(NOV-18)

(3 Hours)   Total Marks: 100

Please check whether you have got the right question paper.
Note : 1. Question No. 1 is compulsory.
   2. Attempt any two questions from question no. 2-4
   3. Attempt any two questions from question no. 5-7
   4. Answer to questions should be grouped and written together.
   5. Figures to the right indicate full marks assigned to the question.

Q1

(A)   What do mean by Ratio Analysis? Explain advantages and disadvantages of Ratio Analysis.   10M

(B)   From the following trial balance and additional information prepare Trading account, Profit   10M
& Loss account and the Balance Sheet of Ranbeer Singh & Sons. For the year ended on 31st
March, 2018.

Particulars	Dr. (Amount)	Cr. (Amount)
Purchases	67,000	-
Sales	-	1,25,000
Salaries	10,000	-
Rent	3,000	-
Carriage inward	2000	-
Purchase Return	-	2000
Insurance	3000	-
Wages	5000	-
Bad Debts	2000	-
Advertisement	5000	-
Opening stock	8000	-
Debtors	35000	-
Creditors	-	19000
Cash in hand	24000	-
Machinery	46000	-
Building	20000	-
Loan from SBI	-	21000
Miscellaneous Expenses	2000	-
Capital	-	65000
Total	**2,32,000**	**2,32,000**

Additional Information
   1) Closing Stock Rs.7600/-
   2) Depreciation on Machinery @ 10% per Annum and Building @15% per Annum.

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Q 2   Journalized the following transactions in the journal of Pallavi Traders for the month of   10M
(A)   October 2018

October 1st	Pallavi started business with cash of Rs. 200000/-
October 5th	Bought goods for cash Rs.10000/-
October 10th	Received a cheque of Rs.35000/- from Kaveri
October 12th	Purchased goods of Rs.56000 @ 10 % cash Discount
October 15th	Sold Motor car for Rs.35000/-
October 20th	Paid Cash to Ms.Neeta Rs.15000/-
October 22nd	Withdrew goods worth Rs.15000/- for personal use.
October 24th	Salaries paid Rs.70000/-
October 27th	Paid Income Tax of Rs.25000/- by cash
October 31st	Paid Insurance Premium of Rs.16250/- by cheque

(B)   What do you mean by Cost? Explain different Cost elements in detail.   10M

Q3

(A)   Explain Master and Flexible Budget in detail.   10M

(B)   What is an Account? What are the different types of Accounts? Explain the golden rules of   10M
accounting with suitable examples.

Q 4

(A)   Prepare Cash Book with Discount, Cash and Bank as Column for October. 2018 of M/s.   10M
Deepika & Co.

October 2018	
1st	Cash balance Rs. 80,000/- and bank balance Rs.10,000/-
5th	Received from Nandesh cash of Rs. 5,000/- and crossed cheque for Rs.35,000/-
6th	Paid to Manish Rs. 3000/- by cheque.
8th	Cash sales Rs. 7,000/-
15th	Deposited into bank Rs. 15,000/-
18th	Purchased goods for Rs. 6,000/-
25th	Surya Enterprise has directly deposited into our bank account Rs.3,000/-
28th	Paid Advertisement Charges by cheque Rs. 1,000/-
30th	Withdrew by cheque Rs.1,500 for office use and Rs. 1,000 for personal use.
31st	Paid Rent Rs.2,500/-

(B)   Explain advantages and disadvantages of a Fund Flow Statement   10M

Q 5

(A)   What is Working Capital? Explain importance of Working Capital.   10M

(B)   From the Following information of Subhod and Kashinath Company :   10M

Particulars	Amount(Rs.)
Sales	15,00,000
Cost of Sales	14,00,000
Net Profit	3,00,000
Inventory	6,00,000
Current Assets	5,00,000
Fixed Assets	8,00,000
Net Worth	10,00,000
Long-term Debt	6,00,000
Net profit before tax and Interest	5,00,000
Current Liabilities	1,00,000

Calculate Gross Profit Ratio, Net Profit Ratio, Current Ratio, Liquid Ratio

Q 6

(A)   Explain the reasons for disagreements in Bank Reconciliation Statements.   10M

(B)   From the following information prepare a Cash Budget for the months of January to April   10M
2018 :

Months	Sales (Rs)	Purchases(Rs)	Wages (Rs)	Manufacturing Expenses(Rs)
Nov 2017	300000	150000	30000	11000
Dec 2017	350000	200000	32000	12000
Jan 2018	250000	150000	25000	9000
Feb 2018	300000	200000	30000	10500
Mar 2018	350000	225000	24000	11000
Apr 2018	400000	250000	26000	12000

Additional information
1.   Opening Cash Balance on 1st January 2018 is Rs.150000/-
2.   The customers are allowed a credit period of two months.
3.   The creditors are allowing a credit of two months
4.   Interest payable Rs.100000/- in April 2018.

Q7

(A)   Explain different methods of Costing.   10M

(B)   Explain Cash Discount and Trade discount with examples   10M

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M.C.A. (SEM - II)
COMPUTER GRAPHICS
(NOV-18)

[3 hours]   Marks:100

N.B   (1)   Question No1 is compulsory.
       (2)   Attempt any four questions out of remaining six questions.
       (3)   Assume any necessary data but justify the same.
       (4)   Figures to the right indicate full marks.
       (5)   Use of scientific calculator is allowed.

Q1.   a)   What is clipping? What are the different types of clipping? Explain the Midpoint   (10)
             subdivision algorithm for the same.

Q1.   b)   Derive the DDA line drawing algorithm and use it to rasterize the line AB with A(10,20),   (10)
             B(20,22)

Q2.   a)   Generate the points on a 2D quadratic Bezier curve with control points A(10,10), B(15,   (10)
             20), C(40, 5). Use the parameter values u=0,0.2,0.4,0.6,0.8,1

Q2.   b)   Derive the matrix for 2D Reflection in an arbitrary line   (10)

Q3.   a)   What are fractals? What is fractal dimension explain in detail   (10)

Q3   b)   Explain the Raster scan and Random scan techniques.   (10)

Q4.   a)   Explain A-buffer algorithm. What are its advantages over Z-buffer algorithm   (10)

Q4.   b)   Derive the matrix for pivot point rotation. Use it to rotate a rectangle ABCD about its   (10)
             center by 90 degrees in anticlockwise direction. The coordinates of the rectangle are
             A(10,10) B(30,10), C(30,20) and D(10,20).

Q5.   a)   What is shading? Explain in detail Gourad shading shading technique   (10)

Q5.   b)   What is animation? Explain he steps in the animation process.   (10)

Q6.   a)   Derive the Bresenham's   circle drawing algorithm   (10)

Q6.   b)   Explain the scanline polygon filling algorithm   (10)

Q7.   Write short notes on

       a)   Color models   (05)

       b)   Parallel Projection   (05)

       c)   Display file structure   (05)

       d)   Halftoning technique   (05)

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M.C.A. (SEM – II)
PROBABILITY AND STATISTICS
(NOV-18)

Total Marks: 100

N.B (1) Question No.1 is compulsory.
   (2) Attempt any four questions out of remaining six questions.
   (3) Assume necessary data but justify the same
   (4) Figures to the right in parenthesis indicate full marks
   (5) Use of scientific calculator is allowed

1. (a) Find Bowley's coefficient of skewness for the following data: (10)

Weekly wages	20-40	40-60	60-80	80-100	100-120	120-140	140-160
No. of people	8	12	20	30	40	35	18

   (b) X is normally distributed and the mean of X is 12 and standard deviation is 4. (10)
   Find the probability of the following:
   1) $X \geq 20$ 2) $X \leq 20$ 3) $0 \leq X \leq 12$
   $P(0 \leq z \leq 2) = 0.4772$ $P(0 \leq z \leq 3) = 0.49865$

2. (a) Find Spearman's rank correlation coefficient for the following data: (10)

Marks in COA	53	98	95	81	75	61	59	55
Marks in OOP	47	25	32	37	30	40	39	45

   (b) A box contains 6 red, 4 white and 5 black balls. A person draws 4 balls from (10)
   the box at random. Find the probability that among the balls drawn there is
   atleast one ball of each colour?

3. (a) 10 coins are thrown simultaneously, Find the probability of getting at least 7 (10)
   heads
   (b) Calculate the mean and standard deviation of the following: (10)

Age	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of workers	3	61	132	153	140	51	2

4. (a) Find the mean and variance of Beta distribution of first kind (10)

   (b) The first of the 2 samples has 100 items with mean 15 and standard deviation (10)
   3. If the whole group has 250 items with mean 15.6 and variance 13.44. Find
   the standard deviation of the second group.

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5. (a) The mean weekly sales of soap bars in departmental stores was 146.3 bars per store. After an advertising campaign, the mean weekly sales in 22 stores for a typical week increased to 153.7 and showed a standard deviation of 17.2. Was the advertising campaign successful? (t_{tab} at 5% LOS is 1.71) **(10)**

   (b) In a random arrangement of the letters of the word "COMMERCE", find the probability that all the vowels come together **(10)**

6. (a) The chances that doctor A will diagnose a disease X is correctly is 60%. The chances that the patient will die by his treatment after correct diagnosis is 40% and the chance of death by wrong diagnosis is 70%. A patient of doctor A, who had disease X, died. What is the chance that his disease was diagnosed correctly? **(10)**

   (b) Following is the age distribution of 125 families. Find the coefficient of variation **(10)**

Age	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Number of people	15	15	23	22	25	10	5	10

7. (a) Find the expectation of the number on a dice when thrown. Also find the variance. **(10)**

   (b) It is believed that the precision (as measured by the variance) of an instrument is no more than 0.16. There are 11 measurements on the instrument. Carry out the test for the belief. **(10)**
   2.5, 2.3, 2.4, 2.3, 2.5, 2.7, 2.5, 2.6, 2.6, 2.7, 2.5
   Chi Square tabulated value is 23.2

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...per / Subject Code: 54706 / Communication & Soft Skills

(Time: 3 Hours)   Total Marks: 100

N.B.: (1) **Question No. 1 is compulsory.**
       (2) Attempt **any four** out of remaining six questions.

Q.1 (a) You have started a website development and hosting company. Write a sales letter to   10
          business houses in your city offering to develop and maintain their website.

     (b) What are the various leadership styles? Which style, according to you would be most   10
          relevant in today's time?

Q.2 (a) What is personality? What are the factors determining personality?   10

     (b) How should you prepare before facing any interview? Elaborate upon a few points.   10

Q.3 (a) The attendance of students in your college is deteriorating since last few years. The   10
          management of college has asked the Principal to make a recommendatory report for
          improving the attendance. Write the report including a brief analysis of the causes for
          poor attendance.

     (b) Discuss in brief about verbal and non-verbal communication. What is more important   10
          according to you?

Q.4 (a) Write a job application letter and resume applying for the post of business analyst in   10
          an IT company.

     (b) Discuss some do's and don'ts for giving presentations.   10

Q.5 (a) What is time management? What steps can you take as a student to manage your time   10
          more effectively?

     (b) What is attitude? How crucial do you feel is attitude for your success?   10

Q.6 (a) Write a notice along with agenda for a meeting of the Student's Council, to plan sports   10
          day of your college.

     (b) What is the difference between a group and a team? What are the benefits of working   10
          in a team?

Q.7   Write short note: 20

     (a) SMART Goals

     (b) 7 C's of communication

     (c) Matrix Organizational Structure

     (d) Barriers to effective communication

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