M.C.A. (Sem - II)
Operating Systems
(May-2017)

Q.P. Code :02870

[Time: Three 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 from the remaining six questions.

1. (a) What is Process? Draw Five state process model and explain each state transition. (10)

    (b) What is Operating System? What are the various services provided by operating system? (10)

2. (a) For the processes listed below the table, draw Gantt chart and calculate Average Waiting Time (10)
         and Average Turnaround Time using
     1. FCFS(First Come First Serve)
     2. SJF (Shortest Job First- both preemptive and non-preemptive)
     3. RR (Round Robin) quantum=4

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

    (b) What is deadlock? What are the necessary conditions for a deadlock occurrence? How can you (10)
         prevent a system from a deadlock? Explain.

3. (a) What is semaphore? Explain different types of semaphore. (10)

    (b) Draw a diagram for Five State Process Model and explain each state transition in it. (10)

4. (a) What is deadlock avoidance? Consider the following snapshot of a system :- (10)

Process	Allocation			Max			Available		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
P0	0	2	1	6	4	2	4	2	4
P1	0	0	1	2	2	1			
P2	2	1	0	3	2	1			
P3	2	0	0	6	0	3			
P4	3	1	1	4	2	2			
P5	1	1	1	2	2	2			

Using Bankers algorithm calculate need matrix, identify Is the system in safe state?

TURN OVER

1

(b) What is Linux OS? What is shell? What are the different types of Shells in Linux? (10)

5. (a) What is thread? Explain the difference between process and thread. What are user level threads (10)
and kernel level threads?

(b) What is the use of Process Control Block (PCB). Discuss the contents of PCB. Discuss how the PCBs (10)
are chained together to form a list of ready processes.

6. (a) Suppose a disk drive has 400 cylinders, numbered 0 to 399. The driver is currently serving a (10)
request at cylinder 120 and previous request was at cylinder 140. The queue of pending request
in FIFO order is :-
86,147,312,91,177,48,309,222,175,130
Starting from the current head position, what is the total distance in cylinders that the disk arm
moves to satisfy all pending request for each of the following disk scheduling algorithm?
1. SSTF
2. SCAN
3. C-SCAN

(b) What is difference between internal and external fragmentation? Discuss the techniques to (10)
overcome fragmentation.

7. Write short note on **_any four_** :- (20)
1. Compiler
2. Priority based Process Scheduling
3. IO buffering
4. Multiprogramming OS
5. Assembler
6. Thrashing

2

M.C.A. (Sem - II)
Accounting and Financial Management
(May-2017)

Q.P. Code : 05091

[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 **two** questions from **2-4**
         3) Attempt any **two** questions from **5-7**
         4) Answer to the questions should be grouped and written together
         5) Figures to the right indicated full marks assigned to the question

Q. 1 (A) Explain fund flow and cash flow statement.   **10**

(B) From the following Trial Balance, prepare trading, profit and loss account and balance   **10**
sheet of Patel Enterprises for the year ended on 31st March 2017.
Trial Balance as on 31st March 2017

Debit	₹	Credit	₹
Opening Stock	35,000	Capital	1,75,000
Purchases	25,000	Sales	56,000
Sales Return	800	Purchase Returns	1,000
Wages	7,600	Sundry Creditors	18,000
Factory Electricity	700	Commission	860
Octroi	350	Bill Payable	3,900
Factory Electricity	1,250	Bank Loan	10,000
Discount	430		
Advertisement	4,000		
Postage	500		
Bad Debt	580		
Telephone Expenses	1,020		
Land & Building	80,000		
Furniture	8,000		
Premises	30,000		
Works Manger's Salary	6,000		
Sundry Debtors	60,000		
Drawings	2,500		
Interest on Loan	1,030		
	2,64,760		**2,64,760**

Adjustments:-
   i)   Closing Stock on 31st march 2017 was valued at ₹. 50,000.
   ii) Depreciate land and building @ 10% and premises @15%

TURN OVER

Q. 2 (A)   i. What is difference between Debit note and Credit note?   **10**
           ii. What is difference between Cash Discount and Trade Discount?

(B) Journalize the following transactions in the Journal of Shri. La1chand for the month of   **10**
March 2017:

2017

01	Commenced business with cash 80,000
04	Goods purchased for ₹ 20,000
06	Paid Freight ₹ 300
07	Sold goods to Shriraj on credit ₹ 22,000
08	Paid for Transport ₹ 1,000
11	Paid Carriage ₹ 500 on Anand's behalf
12	Cash received from Rajesh ₹ 15,400 and allowed him discount ₹ 600
19	Paid Office Insurance Premium ₹ 5,000
25	Distributed goods of ₹ 200 as free samples
29	Paid for Salaries ₹ 8,000

Q. 3 (A) What do you mean by Cost? Explain different Cost elements in detail.   **10**

(B) Write the rules of Personal, Real and Nominal Accounts. Give five examples each of   **10**
personal accounts, real accounts and nominal accounts.

Q. 4 (A) Explain the accounting concepts and accounting conventions   **10**

(B) Enter the following transactions of M/s Vicky Traders in the cash book with cash, bank   **10**
and discount columns and balance the same.

January 2017	
01.	Cash balance 50,000 and bank overdraft ₹ 10,000
03.	Received from Preeti cash ₹. 2,000 and crossed cheque for ₹. 25,000
06.	Paid to Manohar ₹. 3000 by cheque.
09.	Cash sales ₹. 6,000.
13.	Deposited into bank ₹. 5,000
15.	Purchased Furniture for ₹. 4,000.
24.	Prajakta associates has directly deposited into our bank account ₹. 5,000
27.	Paid Advertisement Charges by cheque ₹. 5,000
29.	Withdrew by cheque ₹. 3,500 for office use and ₹. 2,000 for personal use.
30.	Paid Rent ₹. 1,000

TURN OVER

Q. 5 (A) Explain the advantages and limitations of Ratio Analysis.   **10**

    (B)   1)   From the data given calculate: **10**

        (i) Gross Profit Ratio   (ii)   Net Profit Ratio   (iii) Inventory Turnover Ratio

Sales	25,20,000	Other Current Assets	7,60,000
Cost of sale	19,20,000	Fixed Assets	14,40,000
Net Profit	3,60,000	Net worth	15,00,000
Inventory	8,00,000	Debt.	9,00,000
Current Liabilities	6,00,000		

       2)   Compute the following ratios from given information.

        (i) Current Ratio   (ii) Debt-Equity Ratio

Equity share capital	1500000	Fixed Assets	1400000
Reserve fund	100000	Stock	500000
6% Debentures	300000	Debtors	200000
Bills Payable	100000	Cash	100000
Creditors	200000		

Q.6 A) Explain briefly working capital with example.   **10**

     B) State the meaning of budgeting, budgetary control and explain different types of budget.   **10**

Q. 7 (A) From the following data prepare a cash budget for three months from October to December.   **10**

Month	Sales (₹)	Purchases (₹)	Wages (₹)	Expenses (₹)
August	7,00,000	4,00,000	80,000	60,000
September	8,00,000	5,00,000	80,000	70,000
October	9,20,000	5,20,000	90,000	70,000
November	10,00,000	6,00,000	1,00,000	80,000
December	12,00,000	5,00,000	1,20,000	90,000

Additional Information
- i. Cash in bank in 1st October (estimated) ₹ 1,50,00.
- ii. Period of credit allowed by suppliers is one month.
- iii. 10% of sale is for cash and the remaining amount is to be paid in two equal installments in next two months.
- iv. Delay in payment of wages and expenses is one month.
- v. Due amount ₹ 2,50,000 is to be paid in the month of December.

    (B) Write short notes on: **10**

      i.   Batch Costing   ii. Contract Costing

M.C.A. (Sem - II)
Computer Graphics
(May-2017)

Q.P. Code :04106

[Time: 3 Hours]　　　　　　　　　　　　　　　　　　　　　　　　　　[Marks:100]

Please check whether you have got the right question paper.

N.B:　　1. **Q.1 is compulsory**
　　　　　2. **Answer any four questions from Q2 to Q7**
　　　　　3. **Figures** to the **right** indicate **full marks**.
　　　　　4. **Assume any additional information, but justify the same.**

Q.1 a. Compare and Contrast Parallel and Perspective Projections. **10**
　　　b. Consider the line from (7,8) to (16,18). Use DDA algorithm to rasterize the line. **10**

Q.2 a. Write the properties of the curve and Give the derivation of Cubic Bezier curve. **10**
　　　b. Explain Halftone shading technique. **10**

Q.3 a. Write Sutherland Hodgeman algorithm for polygon clipping. **10**
　　　b. Define color models and Explain any three color models with diagram. **10**

Q.4 a. What do you mean by visible surface detection? Explain any one image space algorithm. **10**
　　　b. Write an algorithm for Liang Barsky line clipping algorithm. **10**

Q.5 a. Define Fractals? List and explain the different types of Fractals. **10**
　　　b. Explain homogeneous coordinates and Scale the polygon with coordinates A (2, 5), B(7,10) and C(10,2) by three units in x direction and two units in y direction. **10**

Q.6 a. Explain 3 dimensional Translation, Rotation and Scaling transformations. **10**
　　　b. Plot a circle centered at (10, 4) having a radius of 8 units using midpoint circle algorithm. **10**

Q.7 a. Write short notes on **any 4**: **20**
　　　　　a. Morphing
　　　　　b. Computer Animation
　　　　　c. Flood fill algorithm
　　　　　d. Character generation
　　　　　e. Inside Outside test

M.C.A. (Sem - II)
Probability and Statistics
(May-2017)

Q.P. Code :09923

[Time: Three Hours]   [Marks:100]

Please check whether you have got the right question paper.

N.B: 1. Question Not 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.

Q 1 a) For the following data Find the Bowley's coefficient of skewness, Inter Quartile range, Quartile   **10**
deviation and Coefficient of Quartile deviation

Class Intervals	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10
frequency	10	20	40	80	100	25	10	5	10

Q 1 b) The average test marks in a particular class is 79. The standard deviation is 5 . If the (06) marks are   **06**
distributed normally, how many students in a class of 200 did not receive marks between 75 and 82?

Given: P(c$\leq z \leq$0.7)=0.2580, P(0$\leq z \leq$0.8)=0.2881 P(0$\leq z \leq$0.6)=0.2527, where Z is a standard normal
variate

Q 1 c) Find the mode for the following data   **04**

Marks	0-2	2-4	4-6	6-8	8-10	10-12	12-14
No. of students	10	26	42	58	42	26	10

Q 2 a) Find the Spearman's Rank Correlation coefficient for the following data   **10**
Use correction factor for repeated ranks   **10**

Marks in statistics	15	20	28	12	40	60	20	80
Marks in COA	40	30	50	30	20	10	30	60

Q 2 b) In Manufacturing a certain component, two types of defects are likely to occur with respective   **10**
probabilities 0.05 and 0.1. What is the probability that a randomly selected component
a)   Does not have either kind of defect   b) Is defective?
b)   Has one kind of defect, given that it is found to be defective?

Q 3 b) Find the mean and variance of beta distribution of second kind.   **10**

Q 4 a) The mean of the below data is 33, find the missing frequency.   **10**

Class Intervals	0-10	10-20	20-30	30-40	40-50	50-60
frequency	10	15	30	?	25	20

Also find the median & mode.

Q 4 b)   Prove that Poisson distribution is a limiting case of Binomial distribution   **10**

Q.P. Code :09923

Q 5 a) For the following distribution find the first four moments about the mean **5**

Class Intervals	0-10	10-20	20-30	30-40
Frequency	1	3	4	2

b) Form the information given below, Find the combined mean and combined standard deviation for Group l, Group2 and Group3 **5**

Group No.	SIZE	MEAN	SD
Group	30	5	2
Group	50	7	3
Group	20	6	1

Q 5 c) A random sample of size 16 from a normal population showed a mean of 103.75 cm and the sum of squares of deviations from the mean 843.75 cm^2. Can we say that the population has a mean of 108.75 cm^2, Given the value of to at 5% level of significance for 15 degrees of freedom is 2.131 **5**

Q 5 d) Find the probability that all the vowels in the word `ACCREDITATION' come together **5**

Q 6 a) The probability of a bomb hitting a target is 1/10. Two bombs are enough to destroy the bridge. If ten bombs are aimed at a bridge, find the probability that the bridge is destroyed.

Q 6 b) Prove that geometric distribution is memory less **5**

c) The inter arrival time at a single window railway reservation counter is given to be a Poisson distributed and the service rate is exponentially distributed. If the arrival rate is 2 customers per hour and service rate is 3 customers per hour find **5**
i) The probability that the window is idle   ii) The probability that the window is busy
iii) The average number of customers in the system   iv) The server utilization factor

Q 6 d) Find the coefficient of variation for the following data **5**

Class Intervals	20-25	25-30	30-35	35-40	40-45	45-50
Frequency	8	12	20	25	15	12

Q 7 a) Let X be a random variable for *which E(X) =7* and V(X) =1. Find the values of a and b such that Y= aX-b has expectation 4 and variance 25 **5**

b) State and prove Baye's Theorem **5**

c) The following table gives the number of participants for a certain program during 10 days D1 to D10. Find whether they are uniformly distributed over 10 days **5**

Days	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
No. of Participants	17	20	24	13	25	25	16	12	10	11

Given for 9 degrees of freedom at 5% LOS the critical value of χ^2 =16.9

d) Find the geometric mean of 1, 2, 5, 7, 10,12 **5**

M.C.A. (Sem - II)
Communication and Soft Skills
(May-2017)

Q. P. Code : 511101

(3 Hours) [Total Marks: 100]

N. B.: (1) Question number 1 is compulsory.
(2) Attempt any 4 from question Nos. 2 to 7.
(3) Illustrate answers with sketches wherever necessary.
(4) Do not reveal your identity in the letters and reports.

1. A] Explain the process of Communication and why is communication important for good relationship and effective management? 10

   B] Discuss the factors influencing learning process. 10

2. A] Explain listening barriers and suggest a few measures to overcome them 10
   B] 'Grapevine communication has its own utility in disseminating information' 10

3. A] Do you think it is possible to change attitudes? Discuss how attitudes are formed. 10
   B] Explain the types and the importance of Non-verbal Communication. 10

4. A] Write a detailed Resume` along with a covering letter in response to the following advertisement:
   Royce Technologies is looking for Marketing Executives with 1-2 years of work experience. Candidates should be well versed with C++, Java, excellent communication skills and the ability to lead teams. Interested candidates must apply within 10 days to Manager HR, Royce Technologies, Andheri, Mumbai. 10

   B] What methods are most helpful in overcoming barriers to communication that are Physical? Status based? Cultural? Linguistic? 10

5. A] 'A report is a logical presentation of facts and information'. Discuss the statement with suitable examples. 10

   B] Explain why personality is developmental in nature. What are the primary factors that influence the evolution of personality? 10

6. A] Draft a Memo informing the staff members to attend the orientation session to be held in conference room at 11 a.m. 23rd December, 2016. 10

   B] Skills needed to participate in a Group Discussion effectively. 10

7. Write short notes on: (any four) 20
   a) Social Perception
   b) Downward Vs Upward Communication
   c) SMART Goals
   d) Courtesy in Business Communication
   e) Emotional Intelligence

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Q.P. Code :02537

[Time: Three 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.
3) All questions carry equal marks.

Q.1) (a) Given a set of symbols & corresponding frequency table as below explain the steps to find the Huffman's code (10)

A	G	T	K	S	Z	R	N	Y	D	M	O	I	B	C
1	2	10	2	4	5	7	6	15	4	3	8	4	2	3

(b) What is a linked list? Write algorithms to- (10)
(i) Delete an element from the linked list
(ii) Count the number of elements

Q.2) (a) A binary tree has 10 nodes. The inorder & preorder traversal of the tree are shown below. Draw the binary tree and give the postorder traversal (10)

     Preorder: J C B A D E F I G H
     Inorder: A B C E D F J G I H

(b) What is the meaning of collision in hashing? Explain collision resolution techniques in context of hashing. (10)

Q.3) (a) What is Analysis of algorithm? Explain the Asymptotic Notations (Big O, Ω, θ) used while analyzing an algorithm. (10)

(b) Explain heap as a data structure. Build a Max Heap by investing the following data arriving as a sequential set   23, 7, 92, 6, 12 14, 40, 44, 20, 21.
Show the heap after deleting 2 elements. (10)

Q.4) (a) Write an algorithm for sorting the elements using shell sort. Sort the following elements using shell sort. The increment factor is k=3 (10)
   23, 3, 7, 13, 89, 66, 6, 44, 18, 90, 98, 57

(b) What is a general tree? Explain with suitable example of conversion of general tree to a binary tree. (10)

Q.5) (a) Explain the stack data structure with suitable example. Give algorithms for Push, Pop, Stackempty and Stackfull functions. (10)

(b) Define M-way trees. Build a B-tree of order 4 by inserting data in the sequence given: (10)
    92, 24, 6, 7, 11, 8, 22,4, 5, 16, 19, 20, 78 10

[TURN OVER]

1

Q.6) **(a)** Using modulo-division and linear probing method, store the keys given below in an array of 13 **(10)** elements. How many collisions occurred and what is the density of the list after the keys are inserted.

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

(b) Define an expression tree. Consider following infix expression. Draw the expression tree and **(10)** find prefix and postfix expressions:

(C+D+A*B)/(E+F)+(X+Y)

Q.7) **(a)** What is a minimum spanning tree? Give Kruskal's algorithm to find a minimum spanning tree. **(10)** Determine the minimum spanning tree of the following graph:-
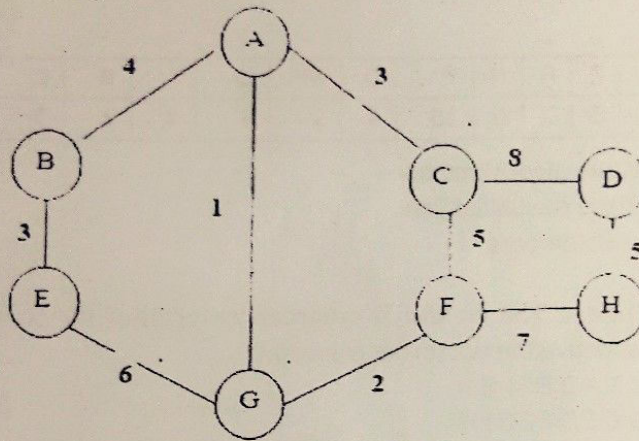
(b) Write short notes on any two of the following: **(10)**
  (i) Priority queue
  (ii) General trees
  (iii) Graph storage structures

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