

MCA sem II M-2014

Subj- Financial Management

QP Code : FR-10268

Hours: 3hours

Tot Marks: 100

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

1. a) Explain the accounting concepts and accounting conventions (10)
b) From the following TB , prepare trading , Profit and loss account and Balance sheet of **Snighdha Engineering** for the year ended on 31st march 2014 (10)

Debit	RS	Credit	RS
Cash	1000	Capital	150000
purchases	82000	creditors	13000
Bank	5000	sales	200000
General expenses	6000	returns	2000
Insurance	2000		
drawings	10000		
debtors	30000		
returns	1000		
Wages	21000		
Fuel and power	10000		
Carriage outward	6000		
Carriage Inward	4000		
Stock	12000		
Building	60000		
investment	20000		
Machinery	40000		
salaries	30000		
furniture	25000		
	365000		365000

Closing stock Rs. 15000

2. a) What are the advantage and disadvantage of Job costing ? (10)
b) Journalise the following transactions in the books of Mr. Ramaa for the month of dec 2013 (10)

Dec 1	Purchased goods of the list price Rs. 20000 at 10% trade discount on credit from MR. Kundan Singh
4	Received Rs. 3700 cash from Yamani in full and final settlement of her account Rs.4000
6	Goods costing Rs. 900 destroyed by fire
9	Sold goods to Mr. Nitin Singh on credit Rs. 10,000
11	Cash taken by proprietor for personal use Rs. 10000

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[TURN OVER

14	Mr. Nitin Singh paid Rs. 9000 after getting 10% cash discount of prompt payment
19	Interest on Bank Loan Rs. 8000 debited to the current account
21	Paid Rs. 8900 to Samish in full and final settlement of his account Rs.9000
24	Cash sales at list price Rs. 8000, trade discount allowed Rs. 400
30	Salaries paid in cash Rs. 9000

3. a) what is bank Reconciliation statement? And give reasons for difference in bank balance. (10)
- b) Write the rules of Personal , Real and Nominal Accounts Give five examples each of personal accounts, real accounts and nominal accounts (10)
4. a) what is ratio analysis and explain advantages and disadvantages of ratio analysis (10)
- b) Enter the following transactions of **M/s. Kapoors** in the cash book with cash, bank and discount columns and balance the same jan 14 (10)

2014 Jan 1	Cash balance Rs. 50,000, bank balance 50,000
3	Received from kimaya cash Rs. 1850 and bearer cheque for Rs. 500
6	Paid to vikas Rs. 3400 by cheque and discount received Rs. 100
9	Cash sales Rs. 4800
10	Cheque received on 3 rd deposited into bank
13	Deposited into bank Rs. 10000
15	Cheque received from Kimaya returned dishonored Rs. 500
18	Purchased goods from Manishankar Rs. 8000 at 10% trade discount and paid half the amount by cash immediately
21	Bank paid insurance premium under our standing instruction Rs. 1390 and collected interest on investment Rs. 2500
23	Cheque issued to vikas was dishonored
24	Mr. XXX has directly deposited into our bank Account Rs.6000
27	Paid salaries by cheque Rs.3000
29	Deposited into bank all cash in excess of Rs. 5000

- 5 a) what is suspense account what role does it play in rectifying the errors disclosed by a trial balance (10)

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b) Calculate Current Ratio and Liquid ratio from the following balance sheet (10)

	2008		2009	
Fixed assets less depreciation		60000		80000
Current assets:				
Stock	120000		188000	
Debtors	100000		164000	
cash	<u>20000</u>	<u>240000</u>	<u>14000</u>	<u>366000</u>
		<u>300000</u>		<u>446000</u>
Share capital		150000		150000
Reserves		30000		60000
Profit and loss a/c		20000		24000
debentures		-----		60000
Current liabilities		<u>100000</u>		<u>152000</u>
		<u>300000</u>		<u>446000</u>

- 6 a) Explain briefly Fund Flow and Cash Flow with examples (10)
 b) State the meaning of budgeting , budgetary control and explain different types of budget (10)

- 7 a) Explain briefly working capital with example (10)

- b) From the following budget data, forecast the cash position at the end of April, May and June 2013 (10)

month	Sales	purchase	wages	Misc exp
Feb	120000	84000	10000	7000
March	130000	100000	12000	8000
April	80000	104000	8000	6000
May	116000	106000	10000	12000
june	88000	80000	8000	6000

Additional information

- **Sales:** 20% realized in the month of sales, discount allowed 2%. Balance realized equally in two subsequent months
- **Purchase:** these are paid for in the following the months of supply
- **Wages:** 25% paid in arrears following month
- **Miscellaneous exp:** paid a month in arrears
- **Rent :** Rs 1000 per month paid quarterly in advance due in april
- **Income tax:** first installment of advance tax Rs. 25000 due on or before 15th june
- **Income from investments:** Rs. 5000 received quarterly , in april , july etc
- **Cash in hand:** Rs. 5000 on 1st april 2013

MCA sem II CBQ M-2014

Sub: Financial Accounting

QP Code : GJ-10286

(3 Hours)

[Total Marks : 80

- N.B.** (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of the **remaining** questions.
(3) Answer to the questions should be **grouped** and written **together**.
(4) **Figures** to the **right** indicates **full** marks assigned to the question.

1. (a) What is Ratio Analysis ? Explain the advantages of Ratio Analysis. Enumerate 10
any two ratios under liquidity Ratios and Solvency Ratios.
(b) From the Following Trial Balance of Shri Deodhar and Sons prepare Trading 10
and Profit and Loss A/c. for the year 31st March, 2014 and Balance Sheet as on
that date :—

Trial Balance as on 31/03/2014

Particulars	Debit Rs.	Credit Rs.
Opening Stock	12,000	
Purchases	40,000	
Wages	2,700	
Carriage	600	
Salaries	6,000	
Rent Rates & Taxes	1,200	
Insurance	800	
Discount	450	
Postage and telegram	520	
Bad Debts	700	
Travelling Expenses	250	
Drawings	1,500	
Machinery	30,000	
Furniture	15,000	
Patents	5,000	
Sundry Debtors	19,000	
Capital		60,000
Sales		30,000
Return outward		800
Sundry Creditors		18,000
Bills Payable		9,000
8% Loan (1-10-2013)		10,000
Bank Overdraft		7,920
Total	<u>1,35,720</u>	<u>1,35,720</u>

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Adjustments :

- (i) Closing Stock-Cost Price Rs. 30,000 and Market Price Rs 32,000.
- (ii) Depreciate Machinery and furniture @ 10% and 5% respectively.
- (iii) Salaries Outstanding Rs. 1200.
- (iv) Insurance prepaid Rs. 200.
- (v) One of the debtors Mr. Dinesh became insolvent Rs. 1,000 was receivable from him.
- (vi) 5% RDD is to be maintained on Debtors.

2. (a) Journalise the following transactions in the Journal of Shri Kale for the month of January, 2014 :— 10

January, 2014	
1	Started business with cash of Rs. 2,00,000 and Computer Rs. 20,000
4	Paid into Dena Bank Rs. 1,00,000
8	Bought goods on credit from Mona Rs. 10,000 at 6% Trade Discount
12	Sold goods to Nayana Rs. 8,000 at 5% Trade Discount
14	Goods worth Rs. 1,050 burnt by fire
18	Received cash of Rs. 7,500 from Nayana in full settlement of her account
21	Withdrew from bank Rs. 5,000 for personal use
24	Paid postage Rs. 100
26	Paid life insurance premium on life of Mr. Kale Rs. 3,000
29	Paid office rent to Landlord Mr. Sujeet Rs. 1,000

- (b) Explain the types of Accounts. Give two examples of each and also state the rules of debit and credit for each type of account. 5

3. (a) Explain any five accounting concepts and conventions. 10

- (b) Explain the following :— 5

- (i) Bad Debts
- (ii) Capital
- (iii) Drawings
- (iv) Assets
- (v) Liabilities.

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4. (a) From the following particulars prepare a Three Columnar Cash Book with Cash 10
Bank and Discount columns :—

December, 2013	
1	Started business with cash Rs. 55,000
2	Opened a current account with Bank of India and deposited Rs. 15,000
3	Purchased goods from X on credit Rs. 3,000
8	Paid to X Rs. 2,850 in full settlement
15	Purchased office furniture for Rs. 3,000 and paid by cheque
18	Sold goods for cash Rs. 2,000 at 10% trade discount
20	Paid insurance premium Rs. 750 by cheque and Rent Rs. 1,000 by cash
22	Withdrew from bank, cash for office use Rs. 3,000
25	Received commission Rs. 900
26	Paid salary Rs. 2,800 by cheque

- (b) Explain the process of preparing Trial balance. 5

5. (a) (i) Calculate capital gearing Ratio from the following information :— 10

Liabilities	Rs.
Equity Share Capital	3,00,000
Reserves	2,00,000
5% Debentures	5,00,000
6% Preference Share Capital	3,00,000

- (ii) The only current assets possessed by a firm are as below. Calculate Current Liabilities if the Current Ratio for the firm is 2 : 1.

Current Assets	Rs.
Cash	1,05,000
Inventories	5,60,000
Debtors	4,20,000

- (iii) Find out debtors turnover from the following data for the year 2012 and 2013 :—

Particulars	2012 Rs.	2013 Rs.
Annual Credit sales	5,00,000	6,00,000
Debtors in the beginning	80,000	90,000
Debtors at the end	90,000	1,10,000

- (b) Explain the advantages of cash flow statement. 5

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6. (a) From the following data prepare a cash budget for six months from January to June :— 10

Month	Total Sales = (Cash Sales + Credit Sales) (Rs.)	Materials Purchases (Rs.)	Salaries and Wages (Rs.)	Production Overheads (Rs.)	Office and Selling Overheads (Rs.)
December	1,00,000	10,000	5,000	5,000	4,000
January	72,000	25,000	10,000	6,000	5,600
February	97,000	31,000	12,100	6,300	6,700
March	86,000	25,500	10,600	6,000	7,500
April	88,600	30,600	25,000	6,500	8,900
May	1,02,500	37,000	22,000	8,000	11,000
June	1,08,700	38,800	23,000	8,200	11,500

Additional Information :

- (i) Cash in bank on 1 st January is expected to be Rs 1,72,500/-.
 - (ii) Assume that 50% of total sales are cash sales.
 - (iii) Assets are to be acquired in the months of February and April of Rs. 8,000 and Rs. 25,000 respectively.
 - (iv) An application has been made to the bank for the grant of a loan of Rs. 30,000 and the loan amount will be received in the month of May.
 - (v) It is anticipated that a dividend of Rs. 35,000 will be paid in the month of June.
 - (vi) Debtors are allowed one month's credit.
 - (vii) Creditors for materials purchased, Production Overheads and office and selling overheads grant one month's credit.
 - (viii) Sales commission at 3% on total sales is paid to the salesman each month.
 - (ix) Salaries and Wages are paid in the same month in which they are incurred.
- (b) Explain the contents of journal. 5

7. (a) Explain the Limitations of Financial Accounting. 10
- (b) Write short notes on :— 5
- (i) Accounting Standards
 - (ii) Advantages of Ledger.

Computer Networks

MCA II

CBGS

QP Code : GJ-10280

(3 Hours)

[Total Marks : 80

- N.B. :** (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions from the remaining questions.
(3) **Figures** to the **right** indicate **full** marks.

1. Answer any **four** from the following :— 20
 - (a) Discuss the different types of topology with its advantages and disadvantages.
 - (b) Explain the terms : Intranet, Internet, Extranet.
 - (c) Write short notes on special addresses with example.
 - (d) Write short notes on ARP.
 - (e) Explain the concept of tunneling in internetworking.
 - (f) Compare between link state and distance vector protocols.

2. (a) An organization is granted a block of addresses with the beginning address 14.24.71.0/24. The organization needs to have 3 sub blocks to use in its 3 subnets as shown below :— 10
 - (i) One subblock of 120 addresses
 - (ii) One subblock of 60 addresses
 - (iii) One subblock of 10 addresses.Design the subblocks and give the slash notation for each subblock. Find how many addresses are still available after these allocations.
- (b) What is the theoretical capacity of a channel if the bandwidth of the channel is 200 KHz and $SNR_{dB} = 6$. 5

3. (a) What is congestion ? Explain the congestion control in TCP. 8
(b) Calculate the CRC for the following bitstream 11101011011 using the divisor 1011. 7

4. (a) Explain the spanning tree creation in broadcast routing. Also explain how the redundant packets are not received by the nodes. 8
(b) What is intra-domain routing ? Explain the intra-domain routing protocols in detail. 7

5. (a) In which layer PPP works ? Explain PPP in detail. 8
(b) Explain how the reliable data transfer is achieved using selective repeat protocol. 7

6. (a) Explain the different queue management algorithms used in routers. 8
(b) Explain the persistent and non-persistent connections of HTTP. What is the difference between persistence HTTP with pipelining and without pipelining ? Which of the two is used by HTTP/1.1 ? 7

7. (a) Write short notes on :— 8
 - (i) CSMA and CSMA/CD
 - (ii) SMTP.
- (b) Explain the 4-way termination process of TCP connection termination. 7

MCA Sem-II (CBGS) M-2014
SUB DS. 22/05/14

QP Code : GJ-10275

(3 Hours)

[Total Marks : 80

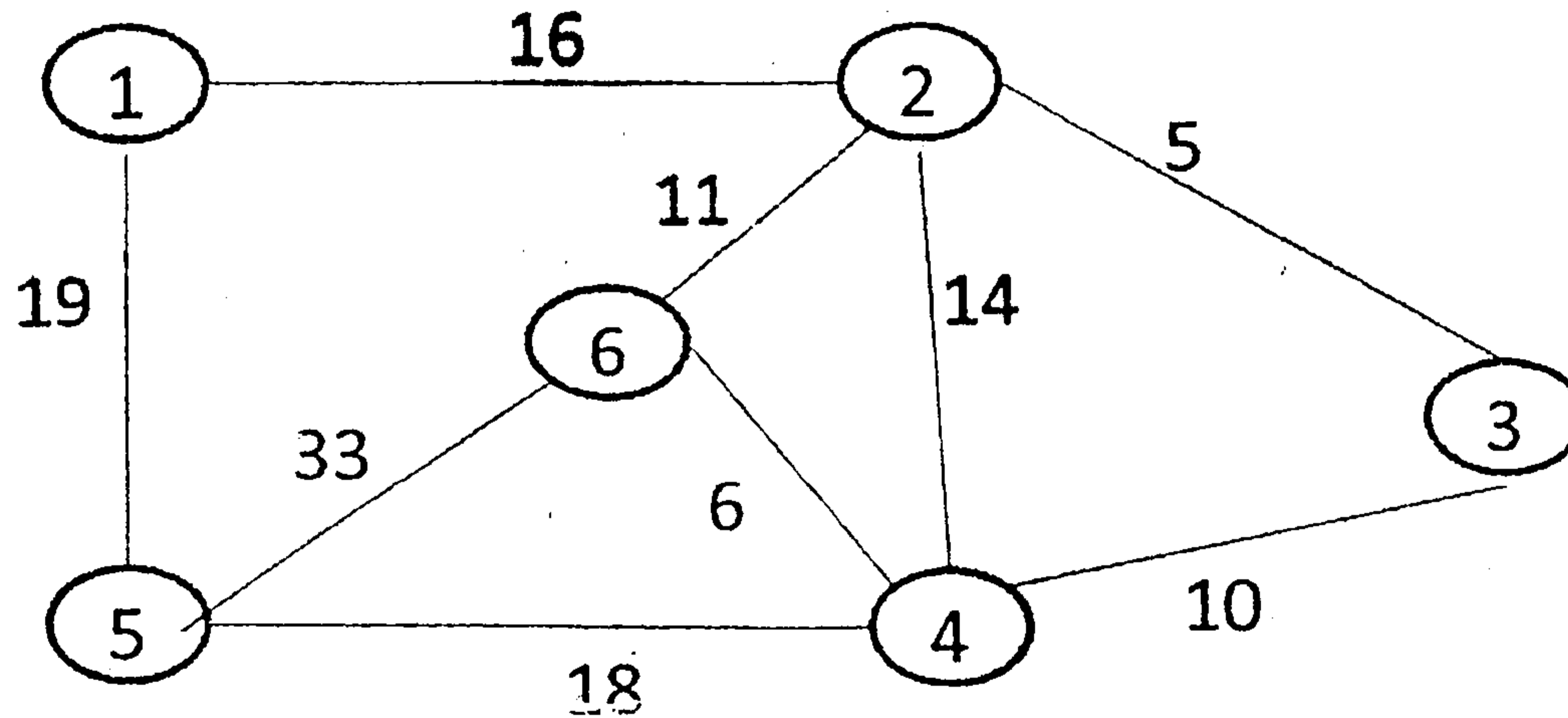
N.B. (1) Question No. 1 is compulsory.

(2) Attempt **any four** out of remaining **six** questions.

(3) Figures to right indicate full marks.

- Q.1 a Write an algorithm for insertion sort. Consider the set of 10 numbers as: 10
- 39, 9, 45, 63, 18, 208, 54, 72, 36
- Show the steps to sort the elements using insertion sort.
- b Given a set of symbols & corresponding frequency table as below. Explain the steps to find Huffman code for each of character 10
- | Symbol | A | C | D | G | I | K | M | N | O |
|-----------|----|---|---|---|---|---|---|---|---|
| Frequency | 10 | 3 | 4 | 2 | 4 | 2 | 3 | 6 | 8 |
- Q.2 a Write algorithms to implement enqueue and dequeue operations in a queue with linked list. 08
- b What is binary tree? Given the following traversals reconstruct the binary tree. 07
- Inorder: 4, 7, 2, 1, 5, 3, 6
- Preorder: 1, 2, 4, 7, 3, 5, 6
- Q.3 a What is the analysis of an algorithm? Explain the notations used while analyzing an algorithm. 08
- b Define max heap. Create a max heap using following: 07
- 42, 23, 74, 11, 65, 3, 94, 36, 99, 87
- Q.4 a Define Doubly linked list. Write an algorithm to 08
- i) Insert a node
- ii) Search the element in doubly linked list
- b Define synonyms in hashing list. Using fold shift method and linear probing, store the keys shown below in hashing list. 07
- 224562, 137456, 214562, 140145, 214576, 162145, 144467, 199645, 234534
- Q.5 a Define binary tree traversal. Explain breadth-first traversal of a graph with example. 08
- b Define minimum spanning tree. Give minimum spanning tree using Kruskal's algorithm for graph shown below: 07

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- Q.6 a Define AVL tree. Construct B-tree of order 3 for following data arriving in sequence: 21,57, 78, 42, 45, 65,71,59 08
- b An array contains the elements shown below. Using binary search algorithm, trace the steps to search element 54. At each loop iteration, show the contents of first, last & mid.
8, 13, 17, 26,44, 56, 88, 97 07
- Q.7 a Define graph. Explain with example how graph is stored into adjacency list and adjacency matrix. 07
- b Distinguish between: (Any two) 08
- i. Binary Search and Sequential Search
 - ii. B-tree and B*tree
 - iii. Singly linked list and Doubly linked list

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QP Code : GJ-10277

(3 Hours)

[Total Marks : 80

Note:

- Question No. 1 is compulsory
- Attempt any four from the remaining six questions
- Assumptions should be made whenever required and should be clearly stated
- Answers to sub questions should be answered together
- Illustrate answers with diagrams wherever necessary

Q1. (a) Differentiate between the following (Any four) 10

- Micro kernel Vs Monolithic Kernel approach
- Fixed partition and dynamic partition
- User thread and kernel thread
- Program threats and system threats
- Multiprogramming and multiprocessing

(b) For the processes listed in the table, draw a Gantt chart & find their average waiting time and average turnaround time using :- 10

- FCFS
- Shortest job first (both preemptive & non preemptive)
- Round Robin(quantum=2)

Process	Arrival time	Processing time
A	0	3
B	1	6
C	4	4
D	6	3

Q2. (a) Explain various process states with the help of diagram & give the list of various transitions which are possible. 7

(b) Given the disk has 100 (0 - 99) cylinders. Suppose the disk queue contains the request for I/O to blocks on the cylinder in following order:

35 , 17 , 25 , 50 , 2 , 40 , 23 . 8

The head of the disk drive is currently at cylinder 21, previous request served was 30. What is the total head movement for the following algorithm.

- SSTF
- SCAN
- CSCAN
- LOOK

Q3. (a) What do you mean by concurrency control? Explain the use of semaphore & monitors in concurrency control with example. 8

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- (b) Discuss the different File Access Methods. Explain the mechanisms of free space management. 7

- Q4. (a) Consider a system with a following current resource allocation State: 8

Process	Allocation			Max			Available		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
P1	2	1	0	2	1	1	0	2	2
P2	1	2	0	2	5	2			
P3	0	1	1	1	4	2			
P4	0	0	1	2	0	1			

Using Banker's Algorithm.

- a) What is the content of matrix need?
 b) Is the system in safe state? Give the sequence.
 c) Is the request from P2 arrives for (1,0,0) , can the request be granted immediately?
- (b) What are the necessary conditions for deadlock to occur? Explain various method of preventing deadlock. 7

- Q5. (a) Consider the pages are referenced in the following sequence. 7
 2, 3, 3, 1, 5, 2, 4, 5, 3, 2, 5, 2, 3
 How many page faults will occur for the following page replacement algorithm, assuming three frames?

- a) LRU replacement b) FIFO replacement c) Optimal replacement

- (b) Explain the concept behind paging with respect to page table? In a simple paging system with 2^{20} bytes of physical memory, 128 pages of logical address space and page size of 2^{10} bytes, how many bits specify the page frame? 8

- Q6. (a) What is fragmentation? What are its types? How can it be tackled? 8

- (b) Explain the concept of Spooling and explain how it is different from buffering? 7

- Q7. Write short notes on: (Any Five) 15

- (a) Linker and Loader
 (b) Clock hardware and software
 (c) Access list and matrix
 (d) Belady's Anomaly
 (e) DMA
 (f) Android OS

Operating Systems

MC A II

QP Code : FR-10262

(3 Hours)

[Total Marks : 100

- N.B.
1. Question 1 is compulsory.
 2. Attempt any Four out of remaining six Questions.
 3. Assumptions should be made whenever required and should be clearly stated.
 4. Answers to questions should be grouped and written together.
 5. Draw the diagrams whenever required.

Q1 (a): For the processes listed below the table, draw Gantt chart and calculate average waiting time and Average turn around time using:- (15)

- (i) FCFS (First come first serve)
- (ii) SJF (Shortest job first) in both conditions preemptive and non-preemptive
- (iii) Round-Robin (quantum=2)

Processes	Arrival Time(ms)	Burst Time(ms)
P1	0	8
P2	0	4
P3	1	6
P4	2	1

Q1(b): Describe the differences among short-term, medium-term and long-term schedulers. (5)

Q2(a) : Suppose a disk drive has 400 cylinders, numbered 0 to 399. The driver is currently serving a 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?

- (i) SSTF
- (ii) SCAN
- (iii) C-SCAN

Q2 (b): What is process? Explain about five-state Process model in Process Management in detail. (8)

Q3 (a): What is virtual memory? Explain paging technique in virtual memory. On a simple paging system with 2^{24} bytes of physical memory, 256 pages of logical address space and a page size of 2^{10} bytes, how many bits are in logical address? (10)

Q3(b): What is thread? Explain various kinds of threads in detail. (10)

Q4 (a): Consider following snapshot of a system:- (12)

Processes	Allocation			Max			Available		
	R1	R2	R3	R1	R2	R3	R1	R2	R3
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 banker's algorithm answers the following:-

- (i) What is the context of matrix need?
- (ii) Is the system in safe state? Give the sequence.
- (iii) If a request from process P1 arrives for (1, 0, 2) can the request be granted immediately?

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- Q4 (b) Explain the difference between micro kernel and monolithic kernel architectures. Give examples of both type of operating system (8)
- Q5(a): What is deadlock? What are the necessary conditions for occurrence of deadlock also mention the methods of handling deadlock? (10)
- Q 5(b): Explain direct memory access (DMA) in detail with suitable example. (10)
- Q6 (a): Which different types of shells are available in UNIX? Explain any five salient features of UNIX and also explain the architecture of UNIX. (10)
- Q6 (b): Discuss different methods of file access and also explain which one is the best access method. (10)
- Q7: Write short notes on any four:- (20)
- (a) Process Control Block (PCB)
 - (b) Buffering
 - (c) Semaphore
 - (d) Multiprogramming, Multitasking, Multiprocessing
 - (e) Context Switching
 - (f) Monitors
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QP Code : GJ-10284

(3 Hours)

[Total Marks 80

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

1. (a) An analyst takes a random sample of 10 recent truck shipments made by a company and records the distance in miles and delivery time to the nearest half-day from the time that the shipment was made available for pick-up as given in the table below. 10

Distance in miles (X)	825	215	1070	550	480	920	1350	325	670	1215
Delivery time in days (Y)	3.5	1	4	2	1	3	4.5	1.5	3	5

- (i) Determine lines of Regression Y on X and X on Y
 (ii) Karl Parson's Correlation coefficient
 (iii) Estimate the Delivery time in days for 1000 miles
 (iv) Estimate the Distance in miles for 2.5 days

- (b) Defined In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5. Assuming the distribution to be normal, find 5
 (i) How many score between 12 and 15?
 (ii) How many score above 18?
 (iii) How many score below 8?
 (iv) How many score at most 14?

[Probability for standard normal variate z ($0 \leq z \leq 0.4$) = 0.1554,
 ($0 \leq z \leq 0.8$) = 0.2881, ($0 \leq z \leq 1.6$) = 0.4452, ($0 \leq z \leq 2.4$) = 0.4918]

- (c) The following figures show the distribution of digits in numbers chosen at random from a telephone directory : 5

Digit	0	1	2	3	4	5	6	7	8	9
Frequency	1026	1107	997	966	1075	933	1107	972	964	853

Test whether the digits may be taken to occur equally frequently in the directory. (χ^2 for 9 d.f. at 5% level of significance is 16.92)

2. (a) The following distribution gives marks of 100 students 8

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	5	8	7	12	28	20	10	10

Find all Quartiles and the coefficient of Quartile Deviation. Use It to determine Bowley's coefficient of skewness.

- (b) A box contains 2^n tickets among which ${}^n C_i$ tickets bear the number i , $i=0,1,2,\dots,n$. A group of m tickets is drawn. What is the expectation of the sum of their numbers? 7
3. (a) State and prove Baye's theorem and use it to determine the probabilities in the following example: In a bolt factory machines A, B and C manufacture respectively 25%, 35% and 40% of total. Of their output, 5, 4, 2 percent are defective bolts. A bolt is drawn at random from the product and is found to be defective. What is the probability that it was manufactured by machines A, B, C? 8
- (b) Define the pdf for a Uniform distribution for a continuous random variable X , $a < x < b$. Determine
 i) Distribution function ii) Mean, Variance iii) Moment generating function. 7

4. (a) (i) Fit a binomial distribution to the following distribution 8

X	0	1	2	3	4	5	6	7
Frequency	7	6	19	35	30	23	7	1

Also find the mean and variance of the fitted distribution

- (b) In a sample of 12 fathers and their eldest sons gave the following data about their height in inches. 7

Father (x)	65	63	67	64	68	62	70	66	68	67	69	71
Son (y)	68	66	68	65	69	66	68	65	71	67	68	70

Calculate co-efficient of rank correlation between x and y

5. (a) Two random variables X and Y have the following probability density function: 8
 $f(x,y) = 2-x-y$; $0 \leq x \leq 1$, $0 \leq y \leq 1$
 $= 0$, otherwise

Find

- (i) Marginal probability density functions of X and Y .
 (ii) Conditional density functions.
 (iii) Var (x) and Var (Y).
 (iv) Co-variance between X and Y .
- (b) Find the mean deviation from mean and median for the following distribution. 7

Class Intervals	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	8	12	10	8	3	2	7

6. (a) (i) A machine is designed to produce insulation washers for electrical devices of average thickness of 0.025 cm. A random sample of 10 washers was found to have an average thickness of 0.024 cm with a standard deviation of 0.002 cm. Test the significance of the deviation. Value of t for 9 degrees of freedom at 5% level is 2.262. 4

- (ii) The letters of the word 'failure' are arranged at random. Find the probability that the consonants may occupy only odd position. 4
- (b) If X and Y are independent Poisson variates show that the conditional distribution of X given $X+Y$ is binomial. 7
7. (a) (i) A Group of 100 items has an arithmetic mean 60 and variance of 25. If the arithmetic mean of 50 of these items is 61 and their standard deviation is 4.5. Find the mean and variance of the remaining 50 items. 4
- (ii) Prove that the Geometric distribution is memory less 4
- (b) A random variable X has the following probability distribution: 7
- | | | | | | | | | |
|---------|---|-----|------|------|------|-------|--------|----------|
| $x:$ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| $p(x):$ | 0 | k | $2k$ | $2k$ | $3k$ | k^2 | $2k^2$ | $7k^2+k$ |
- (i) Find k ,
- (ii) $P(x < 6)$, $P(x \geq 6)$
- (iii) $P(0 < X < 5)$,
- (iv) Determine the distribution function of X .
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