



MET

INSTITUTE OF COMPUTER SCIENCE

UNIVERSITY QUESTION PAPERS (ICS)

RE-EXAM PAPER NOV-2011

SEM-II

SR.NO	SUBJECT	REMARK
1	DATA STRUCTURES	✓
2	OPERATING SYSTEM	✓
3	FINANCIAL MANAGEMENT	✓
4	COMPUTER GRAPHICS	✓
5	PROBABILITY AND STATISTICS	✓
6	COMMUNICATION & SOFT SKILLS	✓

Data structures



51 2nd Half-Exam -11 min (a)

Con. 5753-11.

(REVISED COURSE)

(3 Hours)

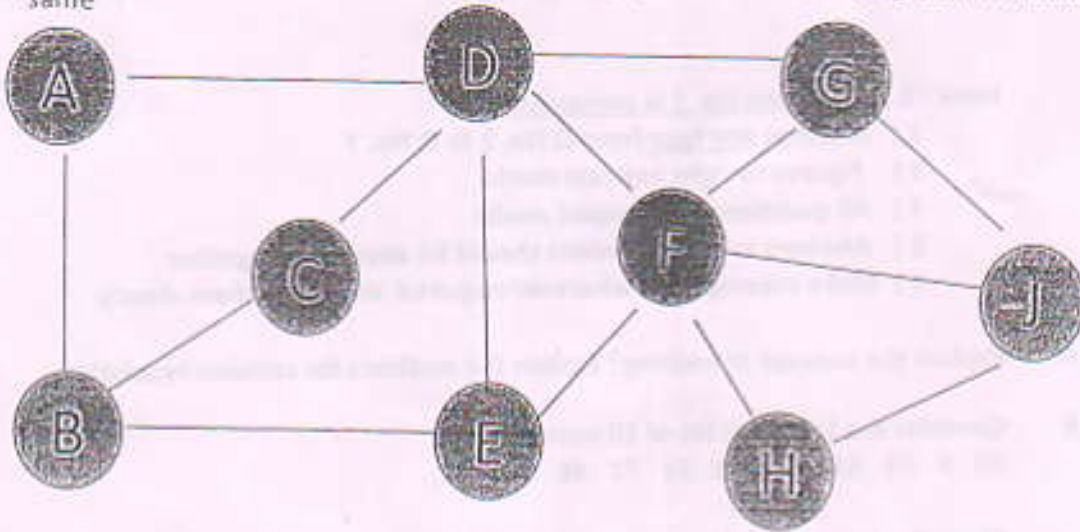
[Total Marks : 100

- Note : 1) Question No. 1 is compulsory
2) Attempt any four from Q No. 2 to Q No. 7
3) Figures to right indicate marks
4) All questions carry equal marks
5) Answers to sub questions should be answered together
6) Make assumptions wherever required and state them clearly

- Q1 A Explain the concept of hashing? Explain the methods for collision resolution 10
B Consider the following set of 10 numbers 10
39 9 45 63 18 208 54 72 36
Show the steps to sort the elements using insertion sort showing the passes and write the algorithm.
- Q2 A Define and explain the stack data structure. Give algorithms for Push, Pop, Top of stack, StackFull and StackEmpty 10
B What is analysis of algorithms? With a suitable example explain the concept of best worst and average case of algorithm. 10
- Q3 A For a singly linked list write algorithms to 10
1. Delete an element
2. Append one list to the other
- B Write an algorithm for binary search. For the following array of 10 elements search 10
231 using binary search. Also trace the steps.
23 67 74 81 93 102 104 125 231 240
- Q4 A Define a circular queue. How is a circular queue implemented using arrays. Give the 10
algorithms for en-queue and dequeue

[TURN OVER

- B Give the depth first traversal of the following graph. Also write the algorithm for the same 10



- Q5 A What is an AVL tree? Explain with a suitable example to rotate an AVL tree left and write the algorithm. 10

- B Given a set of symbols and the corresponding frequency table as below. Find the Huffman's code and explain the steps to get the Huffman's code 10

Symbol	A	B	C	D	E	F	G	H	I	J
Frequency	7	9	11	14	18	21	27	29	35	40

- Q6 A Define a B-tree. Given the following set of numbers create a B-tree of order 3 10

29 8 27 99 19 32 51 41

Show the deletion of three numbers from the B-tree

- B What is a heap? Write algorithms for
1. Building a heap 2. Deleting a heap 10

- Q7 A Explain the data structure binary search tree. Write algorithms for
1. Finding the minimum element from the Binary search-tree
2. Inserting an element in the Binary search-tree 10

- B Define a minimum spanning tree. Explain the Kruskal's algorithm to generate a minimum spanning tree with a suitable example 10



(3 Hours)

[Total Marks : 100

- N.B. : 1) Question No. 1 is compulsory.
2) Answer any four questions from remaining six question.
3) All questions carry equal marks.
4) Assumptions should be made whenever required and should be clearly stated.
5) Draw the diagrams whenever required.

1. (a) For the processes listed in the following table, Draw Gantt Chart and calculate average waiting time and average turnaround time using:- First Come First Served, Shortest Job First(both preemptive & non Preemptive), Round Robin (quantum =2)

Process	Arrival Time(ms)	Processing Time(ms)
P1	8	3
P2	2	1
P3	1	3
P4	3	2
P5	4	4

- (b) When do the page-fault occur? Describe the action taken by O.S. when page fault occurs. 8
2. (a) Define the difference between preemptive and non preemptive scheduling . Explain the different scheduling criteria in detail 10
(b) Given reference string to the following pages by a program 0,4,5,2,0,2,6,1,5,3,3,4,6,4,1,2,1,5,4,2 10
How many page faults will occur for the following page replacement algorithms, assuming four frames?
1. LRU replacement
2. FIFO replacement
3. Optimal replacement
3. (a) What is fragmentation ? What are its types? How does it occur ? How can it be tackled? 10
(b) What is the need of virtual memory? Explain the principles of its operation. Also write the protection & security mechanism in the virtual memory 10
4. (a) Consider the following snapshot of a system: 10

Processes	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 Banker's algorithm,
(i) What is the context of matrix need
(ii) Is the system in safe state ? Give the sequence.
(iii) Is the system currently deadlocked ?
- (b) What is deadlock? and explain how it can be used to avoid a deadlock.

5. (a) What is thread? Explain the different kind of threads. 10
 (b) Consider the head of a moving hard disk with 200 tracks is currently serving a request at track 53. If the queue of requests in FIFO order is 98,183,37,122,14,124,65,67. What is the total head movement under the following scheduling algorithms?
 (1) FCFS, (2) SSTF, (3) SCAN, (4) C-SCAN
6. (a) Explain the clock hardware and software in I/O System. 10
 (b) Discuss the different method of file access and also explain which one is the best access method. 10
7. Write a short notes on any four:- 20
 a) Device driver
 b) Free space management
 c) Unix Shell
 d) DMA
 e) Semaphore
 f) Monitors

MCA-3 sem 1 - Dec - 2011.
Sub: Financial Management
 DATE: 9/12/2011.



Con. 5749-11.

(3 Hours)

[Total Marks : 100]

- 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 indicates full marks assigned to the question.

- Q1. a. What is Cash Flow Statement. What is the need of a cash flow statement. (10)
 b. From the Following Trial Balance prepare Trading & Profit & Loss A/c for the year 31/12/2010 and Balance Sheet as on that date of Premier and Co. (10)

Trial Balance as on 31/12/2010

Particulars	Debit Rs.	Credit Rs.
Sales		3,00,000
Plant & Machinery	1,20,000	
Rent, Rates & Taxes	20,000	
Sales Return	30,000	
Freight	4,000	
Debtors	70,000	
Opening Stock	1,20,000	
Purchases	2,30,000	
Discount paid	5,000	
Interest on Bank Loan	5,000	
Salaries	70,000	
Cash in Hand	5,000	
Purchase Return		10,000
Bank Loan		1,50,000
Capital		1,81,500
Creditors		40,000
Bills payable		26,000
Legal Charges	500	
General Expenses	8,000	
Cash at Bank	20,000	
Total	7,07,500	7,07,500

Adjustments

- Provision for bad & Doubtful Debts @ 5% on Debtors
- Interest on Bank Loan outstanding Rs. 7,000
- Closing Stock on 31st Dec 2010 Rs. 1,20,000

[TURN OVER]

- Q2. a. i. What is the difference between Debit note and Credit Note? (8)
 ii. What is the difference between Cash Discount and Trade discount?

- b. Journalise the following transactions in the Journal of Shri Shiv Kumar Gupta for the month of August 2011. (12)

August
2011

- 1 Commenced business with cash Rs 50,000
 2 Goods purchased for cash Rs. 30,000
 3 Paid Freight Rs. 2,000
 7 Sold goods to R.Kant on credit Rs. 13,000
 8 Paid for Stationery Rs. 1,000
 9 Paid for Rent Rs.5,000
 10 Cash received from Mohandas Rs. 15,400 and allowed him discount Rs. 600
 17 Paid Insurance Premium Rs 4,000
 19 Paid Postage Rs. 100
 20 Rakesh was declared insolvent, fifty paise in the rupee was received from his estate, total debt being Rs. 10,000
 29 Paid for Salaries Rs. 8,000

- Q3. a. What are the reasons for differences in cash book balance and pass book balance? (8)

- b. From the following particulars prepare a Three Columnar Cash Book with Cash, Bank and Discount columns. (12)

May
2011

- 1 Balance at Bank Rs.1,50,000
 2 Drew From Bank for office use Rs.50,000
 3 Bought office furniture for cash Rs. 32000
 8 Paid Wages in cash Rs. 15,000
 14 Drew from bank for office use Rs. 25,000
 16 Sold goods for cash Rs.22,000
 19 Received a crossed cheque from B. Batliwala & Co. in settlement of their account of Rs. 75,000 less 5 percent discount
 23 Bought goods for cash Rs. 45,000
 25 Drew cheque for self Rs. 40,000
 31 Paid Agarwal's account Rs. 40000 by cheque less 2.5 percent discount

- Q4. a - What is meant by Ledger? Why it is necessary to prepare Ledger? (10)

- b. Explain any five accounting principles. (10)

Q5. a. Explain the advantages of Ratio analysis (08)

b. Calculate Current Ratio, Liquid Ratio, Average Payment Period for both the firms X Ltd. and Y Ltd. from the following information (12)

	X Ltd. Rs.	Y Ltd. Rs.
Stock	4,00,000	50,000
Debtors	85,000	70,000
Cash	15,000	30,000
Creditors	2,00,000	1,00,000
Total Purchases	4,65,000	3,30,000
Cash Purchases	15,000	10,000

Terms of Payment is 3 months for both X Ltd. and Y Ltd.

Q6. a. From the following data prepare a cash budget for three months from April to June. (10)

Month	Sales (Rs.)	Purchases (Rs.)	Wages (Rs.)	Expenses (Rs.)
February	7,00,000	4,00,000	80,000	60,000
March	8,00,000	5,00,000	80,000	70,000
April	9,20,000	5,20,000	90,000	70,000
May	10,00,000	6,00,000	1,00,000	80,000
June	12,00,000	5,00,000	1,20,000	90,000

Additional Information

- i. Cash in bank on 1st April (estimated) Rs. 2,50,000/-
- ii. Period of credit allowed by suppliers is two months
- iii. 25% of sale is for cash and the period of credit allowed to customer for credit sale is one month
- iv. Delay in payment of wages and expenses is one month
- v. Income Tax Rs. 2,50,000 is to be paid in the month of June.

b. Write Short notes on : (10)

- i. Batch costing
- ii. Contract costing

Q7. a. What is Gross working capital and Net Working Capital? (10)

b. What is Cost Accounting? Classify cost on the basis of elements of Cost. (10)

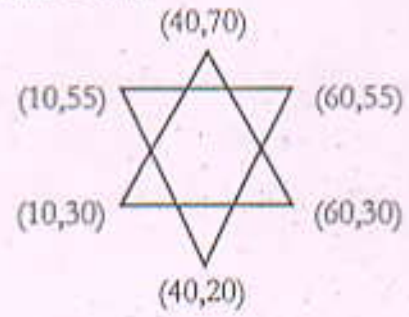


(3 Hours)

[Total Marks : 100

- N.B. :- 1) Q1. is compulsory.
 2) Solve any four from the remaining.
 3) Use of Non-programmable calculators is allowed.
 4) Answers to sub-questions should be grouped together.

- Q1. A Explain the Liang-Barsky line clipping algorithm. (10)
 B Discuss in brief Phong Shading. (05)
 C Explain the relevance of normalized device coordinates. (05)
- Q2. A Discuss the typical characteristics of Bezier Curves and B-Spline Curves along with their applications. (10)
 B Devise a generalized Bresenham's Line algorithms. Rasterise a line A(3,6) – B(9,11) using the same. (10)
- Q3. A Explain the concept of a Display File. How are they useful in storing image definitions? (10)
 B Deduce the mid-point Ellipse algorithm. (10)
- Q4. A Discuss the process of rotating an object about an arbitrary axis. (10)
 B Perform the following 2D transformations (one after the other) on the given image. Draw the resultant image after all the transformations are applied to it (10)
 i) Rotate by $\pi/3$ counter clockwise ii) Scale by 4.5 units in X
 iii) Reflect across Y axis.



- Q5. A Discuss any two methods for visible surface detection. (10)
 B What are Projections? Explain various types of projections. (10)
- Q6. A Explain the Mid-point Subdivision Algorithm with an example. Also list its advantages and disadvantages. (10)
 B Devise a procedure to rotate a rectangle by n degrees in clockwise direction and reduce to 2/3rd of its size by keeping the midpoint fixed. (10)
- Q7. Write Short notes on any four of the following : (20)
 i) Ray Tracing ii) Shear Transformation
 iii) Random Scan Systems iv) Diffuse Illumination
 v) Window to Viewport Transformation vi) HSV Colour Model

Sub: Probability & Statistics.
 DATE: 7/12/2011.



Con. 5751-11.

(3 Hours)

[Total Marks : 100

- N.B. : (1) Question No. 1 is compulsory.
 (2) Attempt any four out of remaining six questions.
 (3) Figures to the right indicates marks.
 (4) Use of scientific calculator is allowed.

Q.1(a) The probability that a student passes a Physics test is $\frac{2}{3}$ and the probability that he passes both the Physics test and an English test is $\frac{14}{45}$. The probability that he passes at least one test is $\frac{4}{5}$. What is the probability that he passes the English test? [5]

Q.1(b) Suppose that the error in the reaction temperature in $^{\circ}\text{C}$, for a controlled experiment is a continuous random variable X having the probability function

$$f(x) = \begin{cases} \frac{x^2}{3} & -1 < x < 2 \\ 0 & \text{elsewhere} \end{cases}$$

- i. Verify $\int_{-\infty}^{\infty} f(x) dx = 1$
 ii. Find $P(0 < x \leq 1)$ [5]

Q.1(c) Find the coefficient of correlation between advertising expenditure (in thousand rupees) and actual sales (in thousand rupees) for the data given below. [5]

Advertising Expenditure	3	7	4	2	1	4	1	2
Sales	11	16	9	4	7	6	3	8

Q.1(d) The number of patients seen in emergency ward of a hospital for a sample of 5 days in the last one month were 153, 147, 151, 156, & 153. Determine the mean deviation [5]

Q.2(a) A candy company distributes boxes of chocolates with a mixture of creams, toffees and nuts coated in both light and dark chocolate. For a randomly selected box, let X and Y ,

[TURN OVER

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respectively be the proportion of light and dark chocolates that are creams and suppose that the joint density function is [10]

$$f(x, y) = \begin{cases} \frac{2}{5}(2x + 3y) & 0 \leq x \leq 1, 0 \leq y \leq 1 \\ 0 & \text{elsewhere} \end{cases}$$

- i. Verify $\int_{-\infty}^{\infty} \int_{-\infty}^{\infty} f(x, y) dx dy = 1$
- ii. find $P[(X, Y) \in A]$ where $A = \left\{ (x, y) \mid 0 < x < \frac{1}{2}, \frac{1}{4} < y < \frac{1}{2} \right\}$

Q.2b(i) A study of 100 software companies gives the following information [5]

Profits (in crores)	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Number of companies	8	12	20	30	20	10

Calculate the standard deviation of the profits earned.

Q.2b(ii) Eight coins are tossed simultaneously. Find the chance of obtaining at least 6 heads. [5]

Q.3a. From the following data on age of employees, calculate the Karl Pearson's coefficient of skewness and comment on the results. [10]

Age(years)	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55
Number of employees	8	20	40	65	80	92	100

Q.3b(i) Let X be a random variable with probability distribution as follows. [5]

x	0	1	2	3
f(x)	1/3	1/2	0	1/6

Find the expected value of $Y = (X - 1)^2$

Q.3b(ii) A television repairman finds that the time spent on his jobs has an exponential distribution with a mean of 30 minutes. If he repairs the sets in the order in which they come in,

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and if the arrival of the sets follows Poisson distribution approximately with an average rate of 10 per 8-hour day, what is the repairman's expected idle time each day? How many jobs are ahead of the average sets just brought in? [5]

Q.4a The lifetime of certain kinds of electronic devices have a mean life of 300 hours and standard deviation of 25 hours. Assuming that the distribution is normal,

(i) Find the probability that any of these electronic devices will have a lifetime of more than 350 hours [10]

(ii) What percentage will have lifetime of more than 300 hours or less?

(iii) What percentage will have lifetimes between 275 and 325 hours?

(Area between $Z = 0$ & $Z = \pm 2$ is 0.4772

Area between $Z = 0$ & $Z = \pm 1$ is 0.3413)

Q.4b(i) A random variable X have the following probability function [5]

Value of $X = x$	0	1	2	3	4	5	6	7
$P(x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2+k$

Find

(i) the value of k

(ii) $P(X < 6)$

(iii) $P(0 < X < 5)$

Q4b(ii) An automobile tyre manufacturer claims that the average life of a particular grade tyre is more than 20,000 km when used in normal conditions. A random sample of 16 tyres was tested and the mean and standard deviation of 22,000 km and 5000 km respectively were computed. Assuming the life of the tyre is approximately normally distributed; decide whether the manufacturer's claim is valid at 5% level of significance. [5]

(critical value of t at degrees of freedom = 15, and 5% level of significance is 1.753)

Q.5a Two hundred randomly selected adults were asked whether TV shows as a whole are primarily entertaining, educational or a waste of time (only one answer could be chosen). The respondents were categorized by gender. Their responses are given in the table below. [10]

[TURN OVER

Gender	Opinion			Total
	Entertaining	Educational	Waste of time	
Male	52	28	30	110
Female	28	12	50	90
Total	80	40	80	200

Is this evidence convincing that there is a relationship between gender and opinion in the population interest?

(At 5% level of significance, degrees of freedom = 2, Chi Square statistic is 5.99)

Q.5b(i) An MCA applies for a job in two firms X & Y. the probability of his being selected in firm X is 0.7 and being rejected in Y is 0.5. The probability of at least one of his applications being rejected is 0.6. What is the probability that he will be selected in one of the firms? [5]

Q.5b(ii) If X is a random variable and 'a' and 'b' are constants, then prove [5]

$$E(aX + b) = aE(X) + b$$

Q.6a The joint probability distribution of two random variables X & Y is given by [10]

$$P(X = 0, Y = 1) = \frac{1}{3}, P(X = 1, Y = -1) = \frac{1}{3}, P(X = 1, Y = 1) = \frac{1}{3}$$

Find

- The marginal distribution of X & Y
- Conditional probability distribution of X given Y = 1

Q.6b(i) Suppose a life insurance company insures the lives of 5000 persons aged 42 years. Studies show that the probability of any 42 year old person will die in a given year is 0.001. The data is said to follow Poisson distribution, find the probability that the company will have to pay at least two claims during a year. [5]

Q.6b(ii) A survey was conducted to determine the age (in years) of 120 automobiles. The result of the survey is given below. Calculate the median age of the automobiles. [5]

Age of Autos	0 - 4	4 - 8	8 - 12	12 - 16	16 - 20
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Number of Autos	13	29	48	22	8
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Q.7a Suppose that life in hours of a certain type of radio tube is a continuous variable X with p.d.f. given by [10]

$$f(x) = \begin{cases} 100 & \text{where } x \geq 100 \\ x^2 & \text{elsewhere} \end{cases}$$

- (i) What is the probability that all of the original three tubes in a given radio set will have to be replaced in the first 150 hours of operation?
- (ii) What is the probability that none of the three of the original tubes will have to be replaced during that first 150 hours of operation
- (iii) What is the probability that a tube will last less than 200 hours if it is known that the tube is still functioning after 150 hours of service?

Q.7b(i) The two regression lines are given by the equations $X + 2Y - 5 = 0$ and $2X + 3Y - 8 = 0$, $\sigma_x^2 = 12$. Find the values of \bar{X} , \bar{Y} and σ_y^2 [5]

Q.7b(ii) The probability that a man is alive after 25 years is $\frac{3}{5}$ and the probability that his wife is alive after 25 years is $\frac{2}{3}$. Find the probability that [5]

- i. both will be alive after 25 years
- ii. only the man will be alive after 25 years
- iii. at least one will be alive after 25 years

Sub = Communication and Skills

SE: 2nd Half-Exam-11 min (e)

Con. 5750-11.



(3 Hours)

[Total Marks : 100

- N. B. : (1) Question No. 1 is compulsory.
(2) Answer any four of the remaining six questions.

Q1.A Explain IPR & Patents with the help of an example
10 Marks

Q1.B Explain the importance of Interviews. Also explain the role of the interviewer & interviewee in an Interview
10 Marks

Q2. Write Short notes on :- (Any 4)
20 Marks

- a. Emotional Quotient
- b. Testimonial
- c. Assertiveness
- d. Telex
- e. Media & Modes of Communication

Q3.A Prepare a notice and Agenda for a meeting to be held in college to discuss the Annual Diwali Mela to be held in your College
10 Marks

Q3.B Also Write the Minutes of the above meeting
10 Marks

Q4.A Write a short note on the different Computer Input Devices
10 Marks

Q4.B What is a Conflict? How do you resolve a Conflict
10 Marks

Q5.A. Write a letter to Mr. Leander Paes inviting him as a Chief Guest for your College Sports Day. Write in Modified Block Form
10 Marks

Q5.B Explain Upward, Downward & Horizontal Communication in detail along with its objectives
10 Marks

Q6.A Define Team Work? Also explain the role of a Leader in a team
10 Marks

Q6.B What are the Ethical & Legal Aspects of Communication
10 Marks

Q7.A Write a Cover Letter to apply for the post of System Administrator at Infosys
10 Marks

Q7.B What are Reports? What are its different types? Also explain Letter of Transmittal
10 Marks

Sub = Communication and Skills

55- 2nd Half-Exam-11 min (a)

Con. 5750-11.



(3 Hours)

[Total Marks : 100

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