

Code : 1P2B21

***M.C.A. II Semester Regular Examinations, July/August 2014
Computer Organization***

Time: 3 hours

Max Marks: 60

*Answer any FIVE of the following
All questions carry equal marks (12 Marks each)*

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1. a) Discuss in detail about the significance of hamming code in error correction with example. 6M
b) Reduce the following function using K- map and implement it using NAND logic. $F = \sum m(0, 2, 3, 4, 5, 6, 9, 11, 14, 15)$ 6M
2. a) What is a flip-flop? Briefly discuss about D and T flip-flops. Give characteristic equation of RS, JK flip-flops. 6M
b) Design 3-to-8 decoder circuit and also construct its truth table 6M
3. a) With neat diagram explain the memory hierarchy in a computer system. 6M
b) What is content addressable memory? Briefly explain the hardware organization of associative memory. 6M
4. a) Define addressing mode. Discuss in detail about different addressing modes and how to encode various addressing modes. 6M
b) Explain about various types of Instruction formats 6M
5. a) Explain in detail about input-output instructions with suitable examples. 6M
b) Explain the shift and rotate instructions with suitable examples. 6M
6. a) Distinguish between the conditional and unconditional transfer instructions 6M
b) What is an interrupt? Explain interrupts and process control instructions briefly 6M
7. a) Explain micro instruction format 6M
b) Distinguish between hardwired & micro programmed control unit. 6M
8. a) Explain programmed I/O and interrupt initiated I/O 6M
b) Explain about Daisy Chain method in priority interrupts. 6M

Answer any FIVE of the following
All questions carry equal marks (12 Marks each)

1. a) (i) Convert $(78)_{10}$ to Binary form.
(ii) Convert $(0.626)_{10}$ to the corresponding Binary fractions 8M
- b) Explain about (i) Fixed – point form (ii) Floating – point form. 4M
2. a) A root of the equation $f(x) = x^3 - 5x + 1 = 0$ lies in the interval $(0, 1)$. Perform four Iterations of the secant method and Regula – Falsi method to obtain root. 6M
- b) Find a real root of the equation $x \log_{10} x = 1.2$ which lies between 2 and 3 by Bisection method. 6M
3. a) Solve the system of equations :
 $10x_1 + x_2 + x_3 = 12$; $x_1 + 10x_2 - x_3 = 10$; $x_1 - 2x_2 + 10x_3 = 9$;
Using Gauss – Jordan method. 6M
- b) Solve the following system by the method of Triangularisation;
 $2x - 3y + 10z = 3$; $-x + 4y + 2z = 20$; $5x + 2y + z = -12$; 6M
4. a) Given $f(2) = 4$, $f(2.5) = 5.5$, find the linear interpolation polynomial Using (i) Lagrange interpolation (ii) Newton's divided difference interpolation. Hence, find an approximate value of $f(2.2)$. 6M
- b) Find the eigen values and eigen vectors of the following matrix 6M

$$\begin{bmatrix} 1 & -6 & -4 \\ 0 & 4 & 2 \\ 0 & -6 & -3 \end{bmatrix}$$
5. a) Find $f(22)$ from the Gauss Forward formula for the data given below 6M

x :	20	25	30	35	40	45
y:	354	332	291	260	231	204
- b) Using Newton's forward interpolation formula for the given table, Obtain the value of $f(x)$ when $x = 1.4$ 6M

x :	1.1	1.3	1.5	1.7	1.9
f(x) :	0.21	0.69	1.25	1.89	2.61
6. a) Using piecewise Cubic interpolation, Obtain the approximate values of $f(-2.5)$ and $f(6.5)$ for the following data 6M

x :	-3	-2	-1	1	3	6	7
f(x) :	369	222	171	165	207	990	1779
- b) Obtain the Cubic Spline approximation valid in $[3, 4]$ for the function given in the table 6M

x :	1	2	3	4
f(x) :	3	10	29	65

Under the natural Spline conditions, $f'(1) = M(1) = 0$ and $f''(4) = M(4) = 0$. 6M
7. a) For the following data find first two derivatives at (i) $x = 1.1$ and (ii) $x = 1.6$ 6M

x :	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y :	7.989	8.403	8.781	9.129	9.451	9.750	10.031
- b) Evaluate $\int \frac{dx}{1+x}$ Using Trapezoidal and Simpson's 1/3rd rule 6M
8. a) Using Euler's method, solve for y at $x = 2$ from $\frac{dy}{dx} = 3x^2 + 1$, $y(1) = 2$, Taking (i) $h = 0.5$ (ii) $h = 0.25$ 6M
- b) Use R – K method to find $y(0.1)$ for the equation $y'' + xy' + y = 0$, $y(0) = 1$, $y'(0) = 0$ 6M

Code : 1P2B26

M.C.A. II Semester Regular Examinations, July/August 2014

Data Structures

Time: 3 hours

Max Marks: 60

*Answer any FIVE of the following
All questions carry equal marks (12 Marks each)*

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|-------|---|-----|
| 1. a) | Discuss in brief linear and nonlinear data structures | 5M |
| b) | What is a sparse matrix? Give an example. How do you represent sparse matrix using a two dimensional array? Write a program in C for addition of two sparse matrices. | 7M |
| 2. | How do you represent polynomials using linked list? Give an example. Write algorithm and program in C for addition of two polynomials. | 12M |
| 3. a) | Discuss about stacks and operations on stacks. Write a program in C for carrying out stack operations, when represented by linked list. | 8M |
| b) | Explain how stacks can be used in evaluation of arithmetic expression, with an example. | 4M |
| 4. | Discuss in detail about linear queues, circular queues and operations on them. Give one application of each type. | 12M |
| 5. a) | Explain the method of Quick sort. Write a program in C for sorting a given list of integers using quick sort. | 8M |
| b) | Sort the following list using selection sort, showing the stepwise process.
5, 3, 10, 90, 82, 4, 12, 15. | 4M |
| 6. a) | What is a hash table? What are the characteristics of a good hashing function? Explain any two hashing functions with example. | 8M |
| b) | Discuss in brief about open hashing and closed hashing. | 4M |
| 7. | Explain the pre order, post order and in order traversals of binary tree with examples. Write the non-recursive procedures (algorithms) for any two traversals. | 12M |
| 8. | Explain in detail about B-Trees. | 12M |

Answer any FIVE of the following
All questions carry equal marks (12 Marks each)

1. What are the different types of models used in operation research? Mention general methods of solving Operation Research models 12M

2. Use Dual Simplex method to solve the following LPP

$$\text{Minimise } Z = -4x_1 - 6x_2 - 18x_3$$

Subject to

$$x_1 + 3x_3 \geq 3$$

$$x_1 - x_2 + x_3 \geq 2$$

$$x_1, x_2, x_3 \geq 0$$

12M

3. A company has three factories A, B and C which supply units to warehouses X, Y and Z every month. The capacities of the factory are 60, 70 and 80 units at A, B and C respectively. The requirements of X, Y and Z per month are 50, 80 and 80 respectively. Transportation cost per unit in rupees is given in the following table. Find out the minimum cost of transportation by using MODIFIED DISTRIBUTION METHOD.

	X	Y	Z
A	8	7	5
B	6	8	9
C	9	6	5

12M

4. A Desk Top Publishing (DTP) operator has 5 jobs to process for which he has to first type a copy of DTP and then printing. The estimated timings (in hours) are as follows. Find the optimal dequence to minimize the idle time. Find optimal sequence to minimize the idle time.

JOBS

	A	B	C	D	E
DTP	5	6	1	9	6
PRINTING	5	8	10	11	8

What will be expected delivery time for job C. If there is urgency for C what sequence is preferred?

12M

5. A firm of thinking of replacing a particular machine whose cost price is Rs.12,200. The scrap price of this machine is only Rs.200. The maintenance costs are found to be as follows.

Year	1	2	3	4	5	6	7	8
Maintenance cost	220	500	800	1200	1800	2500	3200	4000

Determine when the firm should get the machine replaced

12M

6. Solve the game using dominance principle and verify with saddle point of minmax-maxmin

		Firm B				
		B ₁	B ₂	B ₃	B ₄	B ₅
Firm A	A ₁	3	-1	4	6	7
	A ₂	-1	8	2	4	12
	A ₃	16	8	6	14	12
	A ₄	1	11	-4	2	1

12M

7. In railway marshalling yard goods trains arrive at a rate of 30 trains per day. Assuming that the inter-arrival time follows an exponential distribution and the service time distribution is also exponential with an average of 36 minutes. Calculate (i) Expected queue size (line length) (ii) Probability that the queue size exceeds 10. If the input of trains increase to an average of 33 per day, what will be the change in (i) and (ii).

12M

8. Use Dynamic programming to solve $\text{Minimise } Z = Y_1^2 + Y_2^2 + Y_3^2$

Subject to

$$Y_1 + Y_2 + Y_3 = 5$$

$$Y_1, Y_2, Y_3 \geq 0$$

12M

Code : 1P2A25

M.C.A. II Semester Regular Examinations, July/August 2014

Organization Structure & Personnel Management

Time: 3 hours

Max Marks: 60

*Answer any FIVE of the following
All questions carry equal marks (12 Marks each)*

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| 1. a) Define Management. | 6M |
| b) Explain Management significance in corporate business. | 6M |
| 2. a) What is Organizational Structure? | 6M |
| b) Explain any one of the organizational theories of your choice. | 6M |
| 3. a) Explain mathematical planning model in Decision Process. | 6M |
| b) Explain deterministic and probabilistic models in Decision Process. | 6M |
| 4. a) Explain the scope of Human Resource Management. | 6M |
| b) Briefly describe and discuss various perspectives of Human Resources Management, with relevant examples. | 6M |
| 5. a) Differentiate between Recruitment and Selection. | 6M |
| b) Highlighting the significance and purpose of interview as a process, describe its various types, limitations and guidelines for improvements. Give examples | 6M |
| 6. a) What is training? Discuss the importance of training. | 6M |
| b) Explain about evaluating effectiveness of training. | 6M |
| 7. a) Explain the process of Communication | 6M |
| b) Explain different barriers of Communication | 6M |
| 8. Write short note on any three | |
| a) Total Quality Management | |
| b) Performance Management | |
| c) Business Process re-engineering | |
| d) Balanced score card | 4x3=12M |

M.C.A. II Semester Regular Examinations, July/August 2014

BUSINESS DATA PROCESSING USING COBOL

Time: 3 hours

Max Marks: 60

*Answer any FIVE of the following
All questions carry equal marks*

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1. Discuss the Environment Division in COBOL Program with example
2. a) Explain the usage of PICTURE Clause in COBOL.
b) Discuss about the working Storage Section in Data Division.
3. Write a COBOL Program to print an employee data using **Nested IF** statement.
4. Write a short notes on
 - a) Synchronized clause
 - b) Justified clause
 - c) Sign clause
5. Discuss about the different types of PERFORM Statements with syntax and example.
6. Write a simple COBOL file program to implement MERGE verb.
7. How to process Relative Disk File and Indexed Disk File, Explain.
8. Write Short Notes on
 - a) Report section in Data Division
 - b) Subroutine in COBOL.

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