Code: 4P2B22

R-14

M.C.A. II Semester Regular Examinations, August 2015

Business Data Processing

Max. Marks: 60 **Time: 3 Hours**

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

****

UNIT-I

1. a) Explain the Structure of COBOL program. 6M

   b) Write a COBOL program with various sections under Environment Division. 6M

OR

2. a) Explain COBOL coding sheet. 6M

   b) Write about IDENTIFICATION DIVISION, with an example program. 6M

UNIT-II

3. a) Narrate WORKING STORAGE SECTION in detail. Give an example with identifiers employee number(empno), employee name(ename), salary (pay) 6M

   b) Explain decision making statement of COBOL with its syntax.

   Write a program to accept Product code, Product name, Cost price, Selling price and Number of products sold. Calculate profit.

   Profit = (Selling price – Cost price) x Number of products sold

   If profit gained exceeds 2,00,000 calculate commission as 10% of profit, otherwise commission is 7%. Display all the details. 6M

OR

4. a) Write significance of Procedure division in detail 6M

   b) Explain various Conditional Statements of COBOL 6M

UNIT-III

5. a) Explain Redefines and Renames Clause. 6M

   b) Explain various forms of Perform statement with suitable examples. 6M

OR

6. a) Describe the text manipulation with STRING and UNSTRING Statement. 6M

   b) Accept marks in six subjects of sixty students into an array and display the details along with class average 6M

UNIT-IV

7. a) Explain sequential file processing with an example. 6M

   b) Explain the statements used for writing and reading in Index files. Give the benefits of index files over sequential files 6M

OR

8. a) Develop a sequential file program to store and access the data of a bank with the fields Account number, Customer name, Address, Closing balance. 6M

   b) Write about relative files and its benefits. 6M

UNIT-V

9. a) Explain the Report section narrating its benefits. 6M

   b) Describe COPY and CALL statements. 6M

OR

10. a) Present a program to demonstrate the details of students (student number, student name, total marks) in the form of a report using Report section. 6M

    b) Advantages and Disadvantages of COBOL Subroutines 6M

***

Code: 4P2B21

R-14

M.C.A. II Semester Regular Examinations, August 2015

Computer Organization

Max. Marks: 60 **Time: 3 Hours**

Answer *all five* units by choosing one from each unit (5 x 12 = 60Marks)

****

UNIT-I

1. a) Minimize the function F(A,B,C,D) = ∑ (0,1,2,3,8,9,10,11) using Karnaugh Map. 6M
   b) Draw the schematic of a 4-bit left shift register with parallel load using D-type. flip-flops 6M

OR

2. a) Derive the truth table for full-adder and draw the circuit diagram. 6M
   b) Compare and contrast decoder and multiplexer. 6M

UNIT-II

3. a) Discuss the different mapping techniques used in cache memories and their relative merits and demerits. 8M
   b) How many 128 × 8 RAM chips are needed to provide a memory capacity of 2048 bytes? 4M

OR

4. a) Illustrates the components in a typical memory hierarchy with a neat diagram. 8M
   b) Consider a processor system with 32 bit address capability, using 64 KB of cache, arranged to operate as a 4-way set associative cache. Work out the logic which determines the cache hit or miss for this system. Assume you have 20 bit comparators available for the purpose. 4M

UNIT-III

5. a) Write the differences between the general register organizations and stack organization. 4M
   b) List and explain different types of instruction formats with examples. 8M

OR

6. a) Give a brief note on INTEL 8086 CPU architecture. 6M
   b) Explain the instruction format with mode field. 6M

UNIT-IV

7. a) How many times does the control unit refer to memory when it fetches and executes an indirect addressing mode instruction if the instruction is
   (i) a computational type requiring an operand from memory
   (ii) a branch type? 6M
   b) Write an ALP in 8086 to subtract two 8 bit hexadecimal numbers. 6M

OR

8. a) Define Interrupts. List and explain the different types of interrupts. 8M
   b) Briefly explain the assembler directives. 4M

UNIT-V

9. a) Why bus arbitration is required? Explain with block diagram of bus arbitration using daisy chain. 6M
   b) Give the organization of typical hardwired control unit and explain the functions performed by the various blocks. 6M

OR

10. What do you mean by initialization of DMA controller? How DMA Controller works? Why does DMA have priority over the CPU when both request a memory transfer? 12M

***

Code: 4P2B26 **R-14**

M.C.A. II Semester Regular Examinations, August 2015

Data Structures

Max. Marks: 60 **Time: 3 Hours**

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

****

UNIT-I

1. a) Define data structure? Differentiate linear and nonlinear data structure? 6M

   b) What is asymptotic notation? Show that the following equations are correct / incorrect?
   (i) $5n^2 - 6n = \Theta(n^2)$
   (ii) $10n^2 + 9 = O(n)$ 6M

OR

2. Explain about complexity of algorithm? Considering your own example analyze complexity of recursive and non-recursive algorithms? 12M

UNIT-II

3. What is stack? Explain. Using linked list implement the operations of stack? 12M

OR

4. a) What is priority queue? Explain the advantages of priority queues? 6M

   b) What is doubly linked list? Write an algorithm to delete a node from the doubly linked list? 6M

UNIT-III

5. Explain about selection sort. Analyze the worst case performance of quick sort and compare it with selection sort? 12M

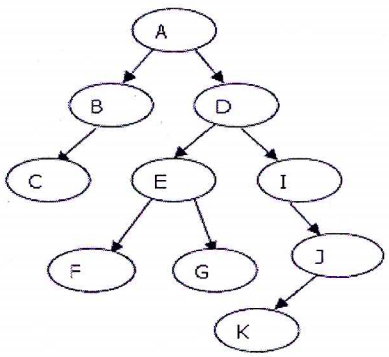
OR

6. a) What is the difference between linear and binary search techniques? Explain. 6M

   b) Write a program in c/c++ for Fibonacci search. 6M

UNIT-IV

7. a) Differentiate Binary tree and Threaded binary tree and explain the storage representation of trees. For the given Binary Tree, perform In-order, Preorder and Post-order traversal.



12M

OR

8. a) What is hashing? Explain the various Collision resolution techniques? 6M

   b) What is hash function? How hash functions are choosed? 6M

UNIT-V

9. a) How graphs are represented? With an example explain the graph traversal methods 6M

   b) How Binary search tree differ from Binary tree? Write an algorithm to insert an element in the binary search tree. 6M

OR

10. Answer the following
    a. Height balanced trees
    b. B Trees
    c. Red-Black Trees 12M

***

Code: 4P2C23

R-14

M.C.A. II Semester Regular Examinations, August 2015

Numerical Methods

Max. Marks: 60 **Time: 3 Hours**

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

****

UNIT-I

1. a) Discuss the types of Errors. 6M

   b) Find the root of equation $f(x) = cosx - xe^x$ using the Newton-Raphson method 6M

OR

2. a) Briefly explain the Bisection method. 6M

   b) Obtain to four decimal places, the root between 1 and 2 of the equation $x^3 - 2x^2 + 3x - 5 = 0$ by using Regula Falsi method. 6M

UNIT-II

3. Find the convergence factor for the Jacobi's and Gauss-Seidel methods for the system $4x_1 + 2x_3 = 4, 5x_2 + 2x_3 = -3\ and\ 5x_1 + 4x_2 + 10x_3 = 2.$ 12M

OR

4. a) Find the largest Eigen value in modulus and the corresponding Eigen vector of the matrix $= \begin{bmatrix} -15 & 4 & 3 \\ 10 & -12 & 6 \\ 20 & -4 & 2 \end{bmatrix}$, using the Power method. 6M

   b) Solve the equations $9x_1 - 2x_2 + x_3 = 50, \quad x_1 + 5x_2 - 4x_3 = 18$ $and\ -2x_1 + 2x_2 + 7x_3 = 19$ by using relaxation method. 6M

UNIT-III

5. a) Fit a curve of the form $y = ae^{bx}$ to the following data

x	2	4	6	8	10
y	4.077	11.084	30.128	81.897	222.62

6M

   b) Fit a straight line of the form $y = a_0 + a_1x$ to the following data

x	1	2	3	4	6	8
y	2.4	3.1	3.5	4.2	5.0	6.0

6M

OR

6. Find the correlation coefficient between $x\ and\ y$ from the following data

X	78	89	97	69	59	79	68	57
y	125	137	156	112	107	138	123	108

12M

UNIT-IV

7. Find the Lagrangian interpolating polynomial of degree 2 approximating the function $y = logx$ defined by the following tabular values.Hence determine the value of $log2.7$.

x	2.0	*2.5*	*3.0*
$y = logx$	*0.69315*	*0.91629*	*1.09861*

12M

OR

8. Interpolate by means of Gauss Backward formula, the population of a town for the year 1974,given that

Year	1939	*1949*	*1959*	*1969*	*1979*	*1989*
Population (In thousands)	*12*	*15*	*20*	*27*	*39*	*52*

12M

UNIT-V

9. The Taylor series for $y(x)$,find $y(0.1)$ correct to four decimal places if $y(x)$ satisfies $y' = x - y^2$ and $y(0) = 1$. 12M

OR

10. Find the solution of $y' = x + y, y(0) = 0$ for $0.4 \leq x < 1.0$ with $h = 0.1$,using the Predictor- Corrector formula. 12M

***

Code: 4P2C24

R-14

M.C.A. II Semester Regular Examinations, August 2015
Operations Research

Max. Marks: 60 **Time: 3 Hours**

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

****

UNIT-I

1. a) Define model. Discuss the steps of modeling 6M

   b) Solve the following linear programming problem using Big M method

$$\text{Min} \quad z = 10\ X_1 + 15\ X_2 + 20\ X_3$$
$$\text{subject to} \quad 2\ X_1 + 4\ X_2 + 6\ X_3 \geq 24$$
$$3\ X_1 + 9\ X_2 + 6\ X_3 \geq 30$$
$$X_1, X_2, X_3 \geq 0$$

6M

OR

2. Solve the following linear programming problem using dual simplex method

$$\text{Min } z = 2X_1 + 4X_2$$
$$\text{subject to } 2X_1 + X_2 \geq 4$$
$$X_1 + 2X_2 \geq 3$$
$$2X_1 + 2X_2 \leq 12$$
$$X_1, X_2 \geq 0$$

12M

UNIT-II

3. A product is produced by four factories A, B, C and D. The unit production costs in them are Rs.2, Rs.3, Rs.1 and Rs.5 respectively. Their production capacities are: factory A – 50 units, B – 70 units, C – 30 units and D – 50 units. These factories supply the product to four stores, demands of which are 25, 35,105 and 20 units respectively. Unit transport cost in rupees from each factory to each store is given in the table

Factories \ Stores	1	2	3	4
A	2	4	6	11
B	10	8	7	5
C	13	3	9	12
D	4	6	8	3

Determine the extent of deliveries from each of the factories to each of the stores so that the total production and transportation cost is minimum. 12M

OR

4. a) Discuss the steps of Hungarian method 6M

   b) Solve the following assignment problem using Hungarian method. The matrix entries are processing times in hours.

Job \ Operator	1	2	3	4	5
1	20	22	35	22	18
2	4	26	24	24	7
3	23	14	17	19	19
4	17	15	16	18	15
5	16	19	21	19	25

6M

UNIT-III

5. A manufacturing company processes 6 different jobs on two machines A and B. Number of units of each job and its processing times on A and B are given in table. Find the optimal sequence, the total minimum elapsed time and idle time for either machine.

Job no.	No. of units of each job	Processing time	
		Machine A (minutes)	Machine B (minutes)
1	3	5	8
2	4	16	7
3	2	6	11
4	5	3	5
5	2	9	7.5
6	3	6	14

12M

OR

6. Four jobs 1, 2, 3 and 4 are to be processed on each of the five machines A, B, C, D and E in the order ABCDE. Find the total minimum elapsed time if no passing of jobs is permitted. Also determine idle time for each machine.

M/c Job	A	B	C	D	E
1	7	5	2	3	9
2	6	6	4	5	10
3	5	4	5	6	8
4	8	3	3	2	6

12M

UNIT-IV

7. A company has a machine whose cost is Rs.30, 000. Its maintenance cost and resale value at the end of different years are as given:

Year	:	1	2	3	4	5	6
Maintenance cost(Rs.)	:	4,500	4,700	5,000	5,500	6,550	7,500
Resale value(Rs.)	:	27,000	25,300	24,000	21,000	18,000	13,000

(a) What is the economic life of the machine and what is the minimum average cost?

(b)The company has obtained a contract to supply the goods produced by the machine for 5 years from now. After 5 years, the company does not intend to use the machine. If the machine, at present, is one year old, what replacement policy should the company adopt if it intends to replace the machine not more than once? 12M

OR

8. a) Explain i) Saddle point ii) Value of the game iii)Dominance property 6M

b) Solve the following game by using the principle of dominance

		Player B					
		I	II	III	IV	V	VI
Player A	1	4	2	0	2	1	1
	2	4	3	1	3	2	2
	3	4	3	7	-5	1	2
	4	4	3	4	-1	2	2
	5	4	3	3	-2	2	2

6M

UNIT-V

9. A stockiest has to supply 400 units of a product every Monday to his customers. He gets the product at Rs. 50 per unit from the manufacturer. The cost of ordering and transportation from the manufacturer is Rs. 75 per order. The cost of carrying inventory is 7.5% per year of the cost of the product. Find i) the economic lot size ii) the total optimal cost (including the capital cost) 12M

OR

10. A company has a demand of 12,000 units/year for an item and it can produce 2,000 such items per month. The cost of one setup is Rs. 400 and holding cost/unit/month is Rs.0.15. Find the optimum lot size and the total cost per year, assuming the cost of 1 unit as Rs.4. Also find the maximum inventory, manufacturing time and total time. 12M

***

Code: 4P2A25

R-14

M.C.A. II Semester Regular Examinations, August 2015

Organization Structure & Personnel Management

Max. Marks: 60 **Time: 3 Hours**

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

****

UNIT-I

1. a) Critically review the definitions of leading authors on management and evolve a comprehensive definition of Management.
   b) What is the importance of management?

OR

2. a) Distinguish between formal and informal organisations?
   b) Examine critically the concept of social responsibility?

UNIT-II

3. a) "Decision making is the primary task of the manager." Comment
   b) Distinguish between personnel management and Human Resource Management.

OR

4. a) What are the dynamics of decision making?
   b) Discuss the Role of personnel manager as line manager and staff manager.

UNIT-III

5. a) Differentiate between Recruitment and Selection. Highlighting the significance and purpose of interview as a process, describe its various types, limitations and guidelines for improvements. Give examples.
   b) "Is training and development necessary?" Explain.

OR

6. a) Why is Human Resource Planning necessary?
   b) What is Performance Appraisal? What purposes does it serve?

UNIT-IV

7. a) What is interpersonal communication?
   b) Examine the importance of Manager as Communicator in a large scale organization. Also discuss the interdependence of Management and communication.

OR

8. a) Write short notes on Development of Attitudes and Values
   b) Define Transactional Analysis. Discuss the applications of it.

UNIT-V

9. a) Explain bench marking.
   b) Write short notes on Business Process Re-engineering.

OR

10. a) Explain Total Quality Management
    b) Explain about Business Process Out Sourcing.

***