

Code: 5P2B22

M.C.A. II Semester Regular & Supplementary Examinations June 2017

Business Data Processing

Max. Marks: 60

Time: 3 Hours

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

UNIT-I

1. a) Sketch out the structure of IDENTIFICATION DIVISION. Describe the mandatory portion. 6M
- b) List the character set of COBOL. What are data names and identifiers? 6M

OR

2. a) What are various divisions in a COBOL source program? Whether all the divisions are mandatory for a program? Indicate the order in which these divisions will appear in a program. 6M
- b) How are files assigned to devices in the ENVIRONMENT DIVISION? 6M

UNIT-II

3. a) Specify the syntax of the following statements:
i. DISPLAY ii. ACCEPT iii. ALTER iv. EXIT v. Basic PERFORM 6M
- b) Explain Decision Making using IF and EVALUATE with an example. 6M

OR

4. a) Discuss the rules for Data Movement. 4M
- b) Write a COBOL program that will read a deck of cards each containing a temperature in Fahrenheit in columns 1-4 and will then print the corresponding temperature in Celsius. Note: The formula to convert temperature from Fahrenheit to Celsius is $C = 5/9 (F-32)$. 8M

UNIT-III

5. a) What is meant by 'REDEFINES' clause? Bring out the concerned rules. 4M
- b) Demonstrate Multi-level Arrays and Tables. 8M

OR

6. a) What is the usage of SCREEN SECTION in COBOL? Write a COBOL program to display a Welcome message using Screen Section features. 8M
- b) What is the role of RENAMES clause? Specify the rules. 4M

UNIT-IV

7. a) Explain the file updation statements for a sequential file in brief. 4M
- b) Write a COBOL program to create an indexed sequential file for Student particulars. Assume two fields: sno (student number) and sname (student name). 8M

OR

8. a) Two files for which records having 2 fields namely, Account Number and Name are available. Write a COBOL program to merge these two files and create a new file based on the ascending order of Account Number. 8M
- b) Discuss the usage of SORT verb. 4M

UNIT-V

9. a) What are the benefits of a report writing module? 6M
- b) Illustrate the use of PROCEDURE DIVISION statements with a COBOL program. 6M

OR

10. a) Define 'Subroutine'. Give the structure of a COBOL subroutine. 6M
- b) Write notes on COPY and CALL statements. 6M

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Computer Organization

Max. Marks: 60

Time: 3 Hours

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

UNIT-I

1. a) Discuss about fixed point and floating point representations. 6M
b) Design 4-to-2 line encoder. Discuss the problems encountered by ENCODER and the ways to rectify them. 6M

OR

2. a) Perform the following Arithmetic operations using **Signed Magnitude representation** and verify whether there is *Overflow or not?* 6M
i. $(+13) + (+9)$ ii. $(+9) + (-13)$ iii. $(+10) + (+18)$
b) Simplify the following Boolean function using K-map : 6M
 $F(A,B,C,D) = \sum m(4,5,6,7,15)$

UNIT-II

3. a) Explain about associative memory. 6M
b) Explain internal organization of memory chips. 6M

OR

4. a) Discuss mapping techniques used in cache memories. 8M
b) Explain Techniques used to write Data in the Cache. 4M

UNIT-III

5. Write in detail about addressing modes. 12M

OR

6. a) Write three, two, one and zero address instructions for the statement $X=(A+B)*(C+D)$ 8M
b) Distinguish between Logical Address and Physical address with an example. 4M

UNIT-IV

7. a) Explain various input output instructions 6M
b) Write an 8086 assembly language program to find the area of a circle. 6M

OR

8. a) Discuss in detail about 8086 interrupts. 6M
b) Write an 8086 assembly language program to convert degree Celsius to Fahrenheit. Use the formula $F=(C/5)*9+32$. 6M

UNIT-V

9. a) Define the following: Micro operations, Micro instructions, Micro program, Micro code. 4M
b) Explain DMA in detail with a neat sketch 8M

OR

10. a) Explain how control signals are generated using hard wired and micro programmed control signals. 6M
b) Explain block diagram of Input-Output Processor. 6M

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Data Structures

Max. Marks: 60

Time: 3 Hours

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

UNIT-I

1. a) How to calculate time complexity of recursive functions and non recursive functions? 8M
- b) What are the time complexities for the following loops?
 // Here c is a constant greater than 1
 for (int i = 2; i <=n; i = pow(i, c)) {
 // some O(1) expressions
 }
 //Here fun is sqrt or cuberoot or any other constant root
 for (int i = n; i > 0; i = fun(i)) {
 // some O(1) expressions
 } 4M

OR

2. a) Explain the asymptotic notation with exact diagram 8M
- b) How to combine time complexities of consecutive loops? 4M

UNIT-II

3. a) Implement a stack using 2 queues. Analyze the running time of stack operations. 6M
- b) Explain the implementation of Deque using circular array 6M

OR

4. a) What is collision in hashing? What are the chances of collisions with large table? Explain with suitable examples. 6M
- b) Write a function (in pseudocode) to insert a node in a double linked list for the following cases.
 i. Inserting a new node before the head
 ii. Inserting a new node at end of the list
 iii. Inserting a new node after the node pointed by pointer p. 6M

UNIT-III

5. a) Execute bubble on the following elements of the array.
 2, 5, 4, 3, 2, 9, 6, 3
 Discuss the running time of counting sort. 6M
- b) What is Binary Insertion sort and Discuss the running time of Binary insertion sort. 6M

OR

6. a) Explain Radix sort with suitable example. 6M
- b) Write an algorithm to search an element in a sorted and rotated array.
 [Example : 3,4,5,1,2 is a sorted and rotated array] 6M

UNIT-IV

7. a) In a right in-threaded binary tree, write a function (in pseudocode) for the following.
- to insert a node to right side of a node given by the pointer p.
 - to insert a node to left side of a node given by the pointer p.
- b) Which of the following statement(s) is TRUE? Explain.
- A hash function takes a message of arbitrary length and generates a fixed length code.
 - A hash function takes a message of fixed length and generates a code of variable length.
 - A hash function may give the same hash value for distinct messages.

OR

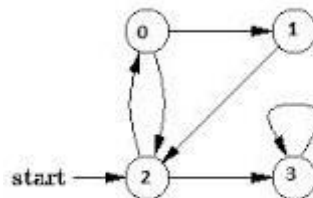
8. a) In a right in-threaded binary tree, write a function (in pseudocode) for Inorder traversal and Preorder traversal.
- b) Write short note on tree traversal.

UNIT-V

9. a) Obtain the height balanced tree (AVL) starting with empty binary tree on the following sequence.
December, january, april, march, july, august, october, february, november, may, june.
- b) A B-tree of order 4 is built from scratch by 10 successive insertions. What is the maximum number of node splitting operations that may take place?

OR

10. a) What is B-Tree. Explain the properties of B- Tree
- b) Execute the Depth First Search algorithm on given graph. In each step, following should be clearly shown.
- Order of vertices in DFS.
 - Finishing time of the vertices of the graph from source.
 - Back edges (cycle in graph).
- Discuss the time complexity of the algorithm.



8M

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Numerical Methods

Max. Marks: 60

Time: 3 Hours

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

UNIT-I

1. a) How do mathematical models contribute to errors in numerical computing 6M
- b) Using Newton-Raphson method, find a positive root of $x^4 - x - 9 = 0$ 6M

OR

2. Find the root of $x e^x = \cos x$ using Regula-False method, correct to four decimal places 12M

UNIT-II

3. By Gauss-Elimination method, solve $5x_1 - x_2 - 2x_3 = 142$,
 $x_1 - 3x_2 - x_3 = -30$, $2x_1 - x_2 - 3x_3 = 5$ 12M

OR

4. Solve the following equations by Relaxation method
 $9x_1 - 2x_2 + x_3 = 50$, $x_1 + 5x_2 - 3x_3 = 18$, $-2x_1 + 2x_2 + 7x_3 = 19$ 12M

UNIT-III

5. Fit a second degree polynomial by the method of least squared to the following data

X	0	1	2	3	4	5	6	7	8
Y	12.0	10.5	10.0	8.0	7.0	8.0	7.5	8.5	9.0

12M

OR

6. Find the linear correlation coefficient between the variables x & y

x	1.2	1.8	3.1	4.9	5.7	7.1	8.6	9.8
y	4.5	5.9	7.0	7.8	7.2	6.8	4.6	2.7

12M

UNIT-IV

7. Consider the following data for $g(x) = (\sin x)/x^2$

x	0.1	0.2	0.3	0.4	0.5
g(x)	9.9833	4.9696	3.2836	2.4339	1.9177

Calculate $g(0.25)$ accurately using Newton's forward method of interpolation 12M

OR

8. Find by Gauss Backward interpolation formula the value of y at $x=1936$ using the following table

x	1901	1911	1921	1931	1941	1951
y	12	15	20	27	39	52

12M

UNIT-V

9. Tabulate $y(0.1), y(0.2)$ and $y(0.3)$ using Taylor's series method, given that $y' = y^2 + x$; and $y(0)=1$ 12M

OR

10. Use Milne's method to find $y(0.8)$ and $y(1.0)$ from $y' = 1 + y^2$; $y(0) = 0$. Find the initial values $y(0.2), y(0.4)$ and $y(0.6)$ from the Runge-Kutta method 12M

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Operations Research

Max. Marks: 60

Time: 3 Hours

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

UNIT-I

1. Define Operations Research. Discuss the origin and development of Operations Research with examples.

OR

2. Discuss the scope and significance of Operations Research in business

UNIT-II

3. Explain the formulation of Linear Programming Problem. Write the Applications and Advantages of typical Linear Programming Problem.

OR

4. Solve the following LP Model using Simplex method

$max z = 3x_1 + 4x_2$ Subject to the constraints

$$x_1 + x_2 \leq 450$$

$$2x_1 + x_2 \leq 600$$

$$x_1, x_2 \geq 0$$

UNIT-III

5. Define transportation Problem. Explain the method of optimizing the Basic Feasible Applying u-v method.

OR

6. A company has six jobs to be processed by six machines. How the jobs should be assigned to the machines so as to maximize the return.

		Job					
		A	B	C	D	E	F
Machines	1	9	22	58	11	19	27
	2	43	78	72	50	63	48
	3	41	28	91	37	45	33
	4	74	42	27	49	39	32
	5	36	11	57	22	25	18
	6	13	56	53	31	17	28

UNIT-IV

7. Define the following terms related to theory of Games.

- Pure strategy
- Mixed strategy
- Saddle point
- Payoff matrix
- Two-persons zero-sum game

OR

8. Reduce the following Game by dominance Property and find the value of the game.

		Player B				
		I	II	III	IV	V
Player A	I	1	3	2	7	4
	II	3	4	1	5	6
	III	6	5	7	6	5
	IV	2	0	6	3	1

UNIT-V

9. Distinguish between PERT and CPM.

OR

10. The following table gives the activities in a construction project and other related information.

Activity	A	B	C	D	E	F	G	H	I
Immediate predecessor	-	A	A	B	B	C	E	D,F	G,H
Optimistic time (days)	4	5	4	15	10	8	4	1	6
Most likely time (days)	6	7	8	20	18	9	8	2	7
Pessimistic time (days)	8	15	12	25	26	16	12	3	8

- Construct the network diagram for the project.
- Find the critical path and compute expected completion time.
- Determine the probability of completing the project in 55 days.

Hall Ticket Number :

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R-15

Code: 5P2A25

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Organization Structure & Personnel Management

Max. Marks: 60

Time: 3 Hours

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

UNIT-I

1. a) What are social responsibilities of management? 6M
- b) Explain about different types of Leadership Styles. 6M

OR

2. What is the need of organization structure? Explain line & Staff organization structure 12M

UNIT-II

3. a) What are the dynamics of decision making? Explain any two decision making models. 6M
- b) Write the difference between Personnel Management Vs HRM 6M

OR

4. What is personnel management? Explain its objectives 12M

UNIT-III

5. What is recruitment? Explain the different types of recruitment methods 12M

OR

6. a) What is the need of MPP? 6M
- b) Explain – Job, Job specifications, Job Description 6M

UNIT-IV

7. What is communication? Write a note on its barriers 12M

OR

8. a) Explain need and develop attitudes and values in its personnel. 6M
- b) Explain interpersonal communication 6M

UNIT-V

9. a) What is quality management? Discuss the strategies of TQM 8M
- b) Describe SIX SIGMA 4M

OR

10. a) Globalization of the economy leads to BPO activities in an increased manner – explain. 6M
- b) Describe bench marking 6M
