

- Note :** (1) Write both the sections in the separate answer books
 (2) Figures to the right indicate full marks.
 (3) Make necessary assumptions wherever necessary.

SECTION-I

- Q.1 Attempt the following.(Any Three) [9]
 (a) What does void main (void) mean?
 (b) When should a type cast be used?
 (c) Why and when do we use the #define directive?
 (d) What is the purpose of scanf() function?
- Q.2 [8]
 (a) Discuss the general structure of a typical C program and explain its components.
 (b) Distinguish between : i) ~~int main() and void main()~~ *data ; if else and switchcase*
 ii) Array and Structure
 OR
 (a) What is initialization? Why is it important?
 (b) Describe the purpose of the qualifiers const and volatile.
- Q3 [8]
 (a) How can we use the getchar() function to read multicharacter strings?
 (b) Discuss the process of compiling a C Program.
 OR
 (a) What are the various storage classes available in C? Briefly discuss each?
 (b) Draw a flowchart for Fibonacci Series.

SECTION-II

- Q4 [9]
 Difference between(Any Three)
 (a) Parameter pass by reference and by value
 (b) Pointer to an array and array of pointers
 (c) Structure and Union
 (d) For and While
- Q.5 [8]
 Answer the following
 (a) Explain malloc() and calloc() function in detail?
 (b) Explain pointer to structure in detail.
 OR
 (a) What is the use of Array? Explain types of array.
 (b) Describe the limitations of using getchar() and scanf() for reading strings.
- Q.6 [8]
 Write short note on the following (Any Two)
 (a) Recursive Function
 (b) Doubly link list
 (c) Types of pointer

Que:1 Answer any three from following.

- ① Explain difference between Trade discount and Cash discount.
- (2) Explain 'Baddebt' and 'Baddebt Reserve'.
- (3) Explain following terms.
 - (1) Contra entry [Cash book]
 - (2) Drawings - Capital.
- 4) Give journal entries for following :
 - ① Purchased goods of Rs. 20000 from ABC mart at 10% trade discount and 5% cash discount paid half the amount by cheque
 - (2) Goods of Rs. 10000, destroyed by fire Insurance company accepted claim of Rs. 8600-.

09

Q:2

- (A) Explain Material mix variance - with illustration.
- (B) Find out (1) Break even sales in units
(2) P.V. ratio (3) Margin of safety when actual sale is of Rs. 40,00,000.

3

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Data : Fixed Expenses: Rs. 600,000
 Selling price per unit - Rs. 50
 Variable cost per unit Rs. 40
 Actual sales Rs. 50,00,000.

OR.

Q:2

Prepare cash budget for three months ending on 30th June 2018.

Cash on hand on 1st April '18 Rs. 50,000.

- (1) 20% of sales is on cash basis and 80% on credit.
- (2) 50% of credit sales realises in the month following the sales and remaining 50% in next month.
- (3) Total purchases are made on credit.
- (4) Time lag for the payment is as under.

credit purchase 1 month
 wages $\frac{1}{2}$ [half] month
 overheads 1 month,

Other financial data is as under.

Month	Sales Rs.	Purchases Rs.	Wages Rs.	Over Heads Rs.
Feb.	8,00,000	500,000	120,000	100,000
March	9,00,000	550,000	180,000	140,000
April	10,00,000	600,000	240,000	150,000
May	12,00,000	6,50,000	300,000	150,000
June	9,00,000	600,000	240,000	120,000

E 204-3

Q:3 Considering following trial balance and additional information prepare Final Trial balance as on 31-3-18 Accounts

Particulars	Debit. Rs.	Credit. Rs.
Purchases - Sales	12,00,000	19,20,000
Goods - returned	60,000	40,000
Wages	80,000	-
Capital - Drawings	80,000	600,000
Salaries	1,10,000	-
Trade expenses	20,000	-
Baddebt - Baddebt Reserve	20,000	12,000
Rent - taxes	30,000	-
Plants - machineries	600,000	-
Furnitures	300,000	-
Debtors - Creditors	1,20,000	10,000
10% Bank Loan [1-1-18]	-	30,000
Discounts	-	8,000
	26,20,000	26,20,000

Additional information

- (1) closing stock was of Rs. 60,000 having market value of Rs. 75,000
- (2) write off Rs. 10,000 from debtors and provide 5% ~~bad~~ baddebt reserve on debtors
- (3) Provide 10% depreciation of on machineries and 20% depreciation on furniture

P.T.O.

Q.4 Rudra Ltd has a project under consideration. Details of the project is as under:

Total Investments Rs. 20,00,000

Cost of Capital 20%, Life of the project 5 years. Rate of tax \rightarrow 50%.

Data regarding profit before depreciation and tax is as under

Year :	Estimated Profits. Rs.	Present value of rupee one is as under.	
		Yr.	Value
I	800,000	I	0.833
II	800,000	II	0.694
III	960,000	III	0.579
IV	480,000	IV	0.482
V	300,000	V	0.402

Evaluate the project under following

- (1) Pay back method
- (2) Net present value method
- (3) Profitability Index.

OR

Q.4 Following are summarised Income statement and Balance sheet of Mittal Ltd for the year ended on 31-12-18. Using such data

calculate following ratios :- [Any four]

- (1) Net profit ratio
- (2) Stock turn over ratio
- (3) Current Ratio
- (4) Debtor's ratio
- (5) Rate of return on Capital employed.

Income Statement

	Amt. Rs.
Total Sales [20% cash]	64,00,000
Cost of Sales	38,40,000
Gross profit	25,60,000
<u>Less</u> office expenses 360,000	
Interest on Deb. 180,000	
Selling expenses <u>500,000</u>	10,40,000
profit	15,20,000
<u>Less</u> Tax at 50%	7,60,000
Net profit	7,60,000

Balance sheet as on 31-12-18.

Liabilities	Rs.	Assets	Rs.
Equity share (capital) of Rs. 10 each	30,00,000	Fixed Assets	34,00,000
Reserves.	880,000	Stock	10,00,000
15% Debentures	12,00,000	Debtors	800,000
creditors.	600,000	Other current Assets	300,000
Bills payable	120,000	Cash, bank	200,000
Bank overdraft.	2,00,000	Preliminary expenses	300,000
	60,00,000		60,00,000

Stock on 1st Jan. 2018 was of Rs. 600,000.

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ERP SECTION E 204-6

Q. 5.

(A) Discuss role of 'Enterprise'

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OR
(A) write characteristics of 'OLAP'

(B) Explain Utility of 'Supply chain Management'

OR
(B) State challenges faced by (BPR) Business process reengineering.

5

C write short note on any one

(1) Data mining

(2) Benefits of 'ERP'

(3) objectives of Data warehousing.

5

Do

M.C.A. (Sem.-1) Examination
Fundamental of Programming
July 2019

Time : 3-00 Hours]

[Max. Marks : 50

SECTION – I

- Q-1** Attempt the following: (Any **THREE**) [09]
- What is a variable? How can variables be characterized? Explain the various data types associated with variables.
 - Explain the purpose of **while** statement. Differentiate entry controlled loop and exit controlled loop.
 - How can character array be declared and defined? Compare single dimension array and multi dimension array?
 - Define recursion. Explain the recursive function with example.

- Q-2** (1) Write a program to find out largest number from elements of an array of 10 elements. [04]
- (2) Explain the importance of header file and also list down header files used in C programming. [04]

OR

- Q-2** (1) Write a program to count the vowels used in a word read by user. [04]
- (2) Write an algorithm and draw flowchart for interchanging values of two variables. [04]

- Q-3** Explain following briefly: [08]
- Conditional operator
 - Scanf() function
 - Pointers
 - Command line arguments

SECTION – II

- Q-4** Attempt the following: (Any **THREE**) [09]
- Describe various storage classes for variables.
 - Explain the concept of dynamic memory allocation and discuss its importance. Differentiate malloc() and calloc() used in C programming.
 - What is user defined Data type? Explain Structure used in C with example.
 - What is File? Explain functions used to read and write Files.

- Q-5** Compare the followings. (Any **TWO**) [08]
- Arrays and Pointers
 - Structure and Union
 - Sequential File Access and Random File Access

- Q-6** Answer the following: [08]
- What is type casting? Discuss the need for explicit type casting.
 - Differentiate functions and macros used in C programming language.
 - Explain sizeof operator used in C program.
 - What is Bitwise operator? Explain its usage.

Instructions:

1. Use separate answer books for each section.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.

SECTION-I.

Q. 1. (a) Let $R = \{(2, 3), (3, 2), (4, 2), (2, 4)\}$ and $S = \{(4, 2), (2, 5), (3, 1), (1, 3)\}$, [3]

Find $R \circ S$, $S \circ R$ and $R \circ R$.

(b) Arrange the following growth rates in increasing order: [2]

$$O(\log n), O(n), O(2^n), O(n^2).$$

(c) Draw Hasse Diagram of the poset $\langle \{2, 4, 6, 9, 12, 18, 27, 36, 48, 60, 72\}, D \rangle$. [4]

Find

- (i) Maximal and minimal elements
- (ii) upper bound of $(2, 9)$ and l.u.b. of $(2, 9)$, if it exist.
- (iii) Lower bound of $(60, 72)$ and g.l.b of $(60, 72)$ if it exist.
- (iv) Greatest and least member, if exist.

2. (a) Define poset. When a poset is said to be lattice? [8]
Determine whether the poset $\langle \{1, 3, 5, 9, 15, 45\}, D \rangle$ is lattice.

(b) State absorption law for lattice. Verify it for $\langle S_{75}, D \rangle$ by taking any two elements of it.

OR

2 (a) Show that the lattice $\langle S_n, D \rangle$ for $n=100$ is isomorphic [8]
to the direct product of lattices for $n=4$ and $n=25$.

(b) Draw the Hasse diagram of lattice $\langle S_n, D \rangle$ for $n=30$ and check, whether it is complemented lattice or not. Explain.

3 (a) Find the power set of $S = \{a, b, c\}$. Draw the Hasse [8]
diagram of $\langle P(S), \subseteq \rangle$. Is it Boolean algebra? If yes, what are the operations of meet and join in it?

(b) Prove the following Boolean identities.

$$(i) a \oplus (a * b) = a \oplus b.$$

$$(ii) a * (b \oplus c) = (a * b) \oplus (a * c).$$

OR

3 (a) Obtain SOP canonical form of Boolean expression [8]
in three variables x_1, x_2 and x_3 for $(x_1 \oplus x_2) * x_3$.

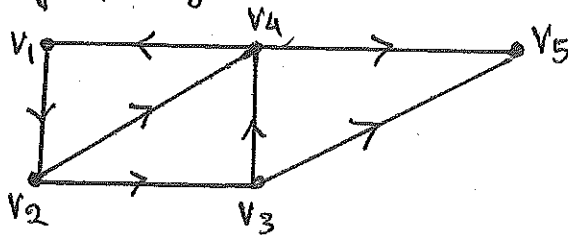
(b) Simplify $f(a, b, c, d) = \sum (0, 2, 7, 8, 10, 15)$
using Karnaugh map.

SECTION-II

Q. 4. (a) Define abelian group. Show that if every element in a group is its own inverse, then the group must be abelian. [4]

(b) Define subgroup of a group. Find proper subgroups of $\langle \mathbb{Z}_5, +_5 \rangle$. [3]

(c) Find the reachability sets of $\{v_1, v_4\}$ and $\{v_4, v_5\}$ for the digraph given below. [2]



Q 5 (a). Define cyclic group. Write generators of the cyclic group $\langle \mathbb{Z}_6, +_6 \rangle$. [8]

(b) Prove that a subset $S \neq \emptyset$ of a set G is a subgroup of the group $\langle G, * \rangle$ iff for any pair of elements $a, b \in S$, $a * b^{-1} \in S$.

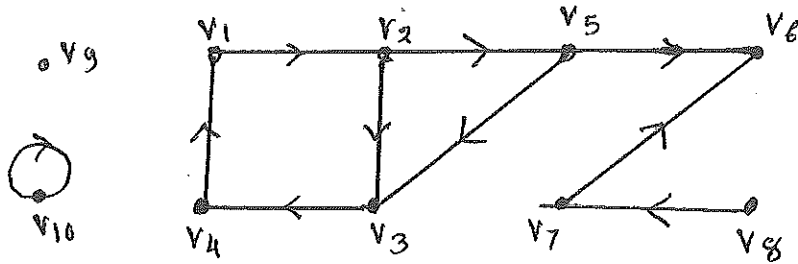
OR

Q 5 (a). State Lagrange's theorem. Define normal subgroup. Determine all the normal subgroups of the symmetric group $\langle S_3, \circ \rangle$. [8]

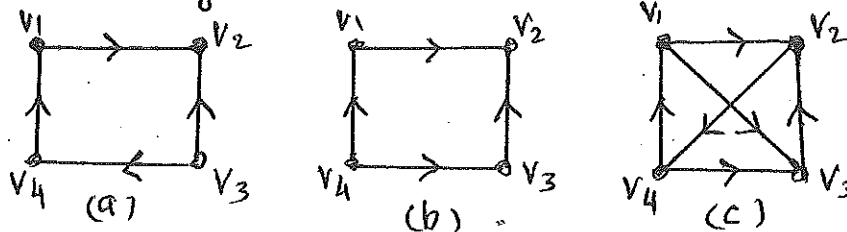
(b) Find the left cosets of $\{[0], [2]\}$ in the group $\langle \mathbb{Z}_6, +_6 \rangle$.

P.T.O.

Q.6 (a) Define node-base of a digraph. Find a node-base [8]
 for the digraph given below. Explain, why no node-
~~base~~ in a node base is reachable from another
 node in the node base.

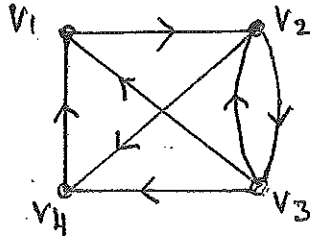


(b) Define weakly, unilaterally and strongly connected
 simple digraphs. For the digraphs given below
 determine whether they are strongly, unilaterally
 or weakly connected.



OR

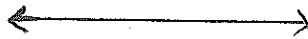
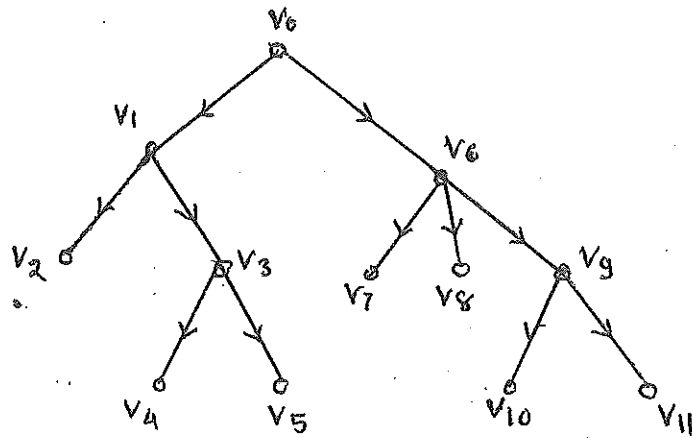
6 (a). Define adjacency matrix of a simple digraph. [8]
 Obtain the adjacency matrix A of the digraph
 given below.



From the adjacency matrix find the out-degrees and
 in-degrees of nodes and verify from the digraph.

E 205- (5)

(b) Define binary tree. Obtain the binary tree corresponding to the tree given below:



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1707E210

Candidate's Seat No : _____

M.C.A. (Sem.-1) Examination
Basics of Computer Organization
July 2019

Time : 3-00 Hours]

[Max. Marks : 50

SECTION - 1

Q1. What are various modes of transfer in input output organization? Explain [9]
each one of them in detail?

Q2. Explain the following: [8]

1. $(415367732)_8 = (\quad)_6 = (\quad)_{16}$?

2. Convert the following SOP(Sum Of Product) into POS(Product Of Sum):-

$$F(p,q,r,s) = p'qr's' + pqrs + pqr's' + p'q'rs + p'q'r's + pqrs'$$

OR

Q2. Solve the following: [8]

1. Draw a truth table for $A(A(B+CD))$. Draw a logic circuit for $(A + C)(C + D)$.

2. Explain full adder with the help of truth table and logic circuit.

Q3. 1. Explain CRC (Longitudinal Redundancy Check) with example. [8]

2. what is DeMorgan's Theorem? Explain with example? Explain the commutative law with example?

OR

Q3. Solve the following: [8]

1. Simplify the following using k-map:

$$f(A,B,C,D) = \sum m(4,6,7,10,11,15)$$

2. Define Memory Hierarchy with Diagram?

P. T. O.

SECTION - 2

E210 - 2

Q4. What are the various addressing modes in CPU ? Explain each one of them with an example? [9]

- Q5. 1. What is operating system? What are various types of operating? [8]
2. What will be the quotient and remainder of following binary problem $(1100110011001)_2 / (1101)_2$?

OR

- Q5. 1. Explain ROM and types of ROM. [8]
2. Define microprocessor and integrated circuits?

- Q6. 1. What is printer? How Impact printer is differ from Non-Impact printer? [8]
2. what do you understand by cache memory?

OR

- Q6. 1. Explain SR flip flop with the help of a logic circuit and truth table. [8]
2. Draw a flow chart diagram of classification of computers? How analog computers are different from digital computers?
-

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1807E215

Candidate's Seat No : _____

M.C.A. (Sem.-1) Examination
Data Base Management System-I

Time : 3-00 Hours]

July 2019

[Max. Marks : 50

- Instructions: (1) Use separate answer-sheet for each section
(2) Figures in the right indicates full marks
(3) Make and state clearly all assumptions wherever appropriate

SECTION - I

- Q -1 Attempt the following (any three) 12
1. List and explain different data abstraction with appropriate figure.
 2. What do you mean by DBA? Explain functions of DBA.
 3. What is a data model? Explain the relation data model in detail with example.
 4. Define: DBMS. Write applications of DBA. What are disadvantages of DBMS?
- Q -2 Attempt the following 10
1. HMV Records has decided to store information about musicians who perform on its albums (as well as other company data) in a database. The company has wisely chosen to hire you as a database designer.
 - Each musician that records at HMV has an SSN, a name, an address, and phone number. Poorly paid musicians often share the same address, and no address has more than one phone.
 - Each instrument used in songs recorded at HMV has a unique identification number, a name (e.g., guitar, synthesizer, flute) and a musical key (e.g., C, B-flat, E-flat).
 - Each album recorded on the HMV label has a unique identification number, a title, a copyright date, a format (e.g., CD or MC), and an album identifier.
 - Each song recorded at HMV has a title and an author.
 - Each musician may play several instruments, and a given instrument may be played by several musicians.
 - Each album has a number of songs on it, but no song may appear on more than one album.
 - Each song is performed by one or more musicians, and a musician may perform a number of songs.
 - Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course.

Design a conceptual schema for HMV and draw an ER diagram for your schema. The preceding information describes the situation that the HMV database must model. Be sure to indicate all key and cardinality constraints and any assumptions you make.

OR

Draw and explain the Database system structure in detail.

- Q-3 Do as directed 03
1. Differentiate: Data and Information
 2. What is logical data independence?
 3. What do you mean by degree of a relation?

SECTION – II

- Q-4 Attempt the following (any three) 12
1. Define the following with example
i. Super Key ii. Candidate Key iii. Data Dictionary iv. Primary key
 2. What is normalization? Why is it required? Explain Insert, Update and Delete anomalies with appropriate example.
 3. Write all the 6 rules of Armstrong's axioms.
 4. You have given a relation with attributes ABCD. List all the functional dependencies that the following relation instance satisfies.

X	Y	Z
x ₁	y ₁	z ₁
x ₁	y ₁	z ₂
x ₂	y ₁	z ₁
x ₂	y ₁	z ₂

- Q-5 Attempt the following queries using relational algebra and in SQL (any five) 10
- Sailors(sid:integer,sname:string,rating,age)
- Boats(bid:integer,bname:string,color:string)
- Reserves(sid:integer,bid:integer,day:date)
1. Find the names of sailors who have reserved boat 103.
 2. Find the names of sailors who have reserved a red boat.
 3. Find the names of sailors who have reserved all boats.
 4. Find the colors of a boat reserved by Leena.
 5. Find the name of sailors who have reserved at least one boat.
 6. Find the name of a sailors who does not reserve a green boat.

- Q-6 Do as directed 02
1. What is the main difference between 3NF and BCNF? Explain with example. 01
 2. Why some functional dependencies are called trivial?