

2016

Time : 3 hours

Full Marks : 80

*Candidates are required to give their answers in  
their own words as far as practicable.*

*The questions are of equal value.*

*Answer any five questions.*

1. Define the following terms :
  - (a) Operation on sets
  - (b) Power sets
  - (c) Groups
  - (d) Partitions of a set
  
2. (a) Let  $A = \{ 1, 2, 3, 4, 5 \}$ ,  $B = \{ 1, 2, 3, 4 \}$  and  $S = \{ 1, 2, 3, 4, 5, 6, 7, 8, 9 \}$  then find the following :
  - (i)  $A \cup B$

- (ii)  $A \cap B$   
(iii)  $(A \cup B) \cap S$   
(iv)  $(A \cap B) \cup S$
- (b) In a university 60% of the teacher play tennis, 50% of them play football, 70% play cricket and 20% play tennis and football, 30% play tennis and cricket and 40% play football and cricket. What is the percentage of teachers who play tennis, play football and play cricket ?
3. Let  $A = \{1, 2, 3, 4\}$ . Define the following relation  $R$  on  $A$ , if  $a R b$  and  $a < b$  then find the following :  
(a) Graphical Representation of the relation  
(b) Matrix representation of the relation.  
(c) Find the Domain and Range of the relation.
4. If  $A = \{1, 3, 5\}$ . Let  $R$  be a Relation, such that  $x R y$  : if  $y = x + 2$  and  $S$  be the relation, such that  $x R y$  : if  $x < y$  then find the following :  
(a) Find  $R \circ S$

- (b) Find SoR
- (c) RoS and SoR via a diagram
5. (a) If  $f(z) = 2^{z-2}$  then find the value of  $f(-1.5)$ .
- (b) If  $f(x) = ax^2 + bx + c$ .  $f(1) = 3$  and  $f(4) = 32$   
then find the value of b.
6. Find the power set of the following sets :
- (a)  $\{0, 1\}$
- (b)  $\{2, 1, 7\}$
- (c)  $\{1, \{2, 3\}\}$
- (d)  $\{a, b, c, d\}$
7. (a) Show that set of all divisors of 70 from a lattice.
- (b) If  $S = \{2, 3, 5, 9, 12, 15, 18\}$  then find the relation R on S where  $S = \{(x, y) \in R, x \text{ divides } y\}$ .
- (i) Construct Hasse diagram.
- (ii) Maximal and Minimal Element.
- (iii) Is Poset a Lattice ?

8. (a) Minimize the Boolean expression given by the function.

$$f(P, Q, R, S) = \{ (0, 3, 4, 5, 7) \}$$

$$d(P, Q, R, S) = \{ (8, 9, 10, 11, 12, 13, 14, 15) \}$$

- (b) Minimize the Boolean function of the given expression :

$$F = x^1yz + x^1yz^1 + xy^1z^1 + xy^1z$$

9. Draw a Karnaugh map 3-variable.

10. Write short notes on any **two** of the following :

- (a) Vector space
- (b) Relation
- (c) Composition of function
- (d) Lattice



ZI - 29/2 (100)

(4) BCA(II) — Dis. Math  
(BC - 201)

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(BC – 202)**

**2016**

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1. What are the different types of basic logic gates ? Explain with the help of truth table and give an example of each gate.
2. (a) Design a 4 – to – 1 line multiplexer. Write down its function table.  
(b) Design a 3 bit binary counter using flip flop.
3. (a) Explain the virtual memory concept of memory management.

- (b) Construct the block diagram of Random Access Memory (RAM). Also discuss the various types of ROM.
4. (a) What do you mean by addressing modes ? Discuss any four addressing modes.  
 (b) Explain the structure and functioning of Arithmetic Logic Unit (ALU).
5. (a) Simplify the following  $F(A, B, C, D) = \Sigma(0, 1, 2, 6, 8, 9, 10)$  using k-map.  
 (b) Draw the logical circuit for the expression  $f = ABC + A\bar{B}C + A\bar{B}\bar{C}$ . Simplify the expression using Boolean Algebra.
6. (a) Explain Booth's Multiplication Algorithm with suitable example.  
 (b) Explain combinational circuit.
7. Convert in binary number and do the arithmetic operation using 2's complement indicate overflow / under flow if any :  
 (a)  $(6)_{10} + (-13)_{10}$   
 (b)  $(45)_{10} + (-15)_{10}$
8. What is the reason for hierarchical memory organization in modern computers ? Draw memory organization hierarchy map for access time and cost.
9. (a) Explain the difference between RAM and ROM.  
 (b) Discuss T-Flip-Flop.
10. Write short notes on any two of the following :  
 (a) Bus organization  
 (b) Shift Register  
 (c) Sequential circuit  
 (d) Universal Gates  
 (e) K-Map

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*(BC-203)*

**2016**

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*Answer any five questions.*

1. Discuss the different types of Decision Making and branching statements in "C" with syntax and examples.
2. (a) Write a "C" Programme to enter three number print maximum of the given three numbers.  
(b) Write a "C" Program to print a table of given number.

3. (a) What is Loop ? Distinguish between for loop and do while loop with example.
- (b) Write a "C" Program to print all prime number from 2 to n given number.
4. What is String ? Write down any five strong function with syntax and example.
5. (a) Write a "C" Programme to enter a string print. How many vowels and consonants are present in the given string ?
- (b) Write a "C" Programme to enter a number. Check that given no is Armstrong number or not.
6. What is Data Structure ? Discuss the different types of Data Structure.
7. Define stack with diagram. Write down the algorithm for push and pop operation in stack. Write a "C" Program to implement the stack operation using array.
8. What is searching and sorting ? Write down the algorithm and program of bubble sort.
9. What is Binary Tree ? Discuss binary tree traversal and also write down the algorithm of different types of binary tree traversal.
10. Write short notes on any **three** of the following :
- (a) Tree Traversals
  - (b) Binary Tree
  - (c) Queues in "C"
  - (d) Call by Value and Reference
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**2016**

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*Answer any **five** questions.*

1. Explain Accounting. Discuss the concepts and conventions of Accounting.
2. What is Journal ? Discuss the classification of journals with examples.
3. Explain Bill of Exchange. Discuss its feature. Differentiate between Bill of Exchange and Promissory Notes.
4. Define Consignment and discuss the features of it. Differentiate between Consignment and Sales of Goods.

5. Define Non-profit Organization. What is the difference between Receipts & Payments A/c of Income & Expenditure A/c ?
6. Explain the Indian Accounting Standard. Discuss the objective of Indian Accounting Standard.
7. Prepare a Double Column Cash Book as on 31.03.2016 from the following information given below :

01.03.2016	Cash in hand ₹ 50,000
	Cash at Bank ₹ 60,000
02.03.2016	Goods purchased ₹ 10,000
04.03.2016	Goods sold ₹ 20,000
05.03.2016	Salary Paid ₹ 10,000
07.03.2016	Cash deposited in Bank ₹ 5,000
08.03.2016	Rent paid ₹ 3,000
10.03.2016	Dividend received ₹ 2,000
12.03.2016	Cash withdrew for personal use ₹ 5,000

15.03.2016 Cheque received from Ram  
₹ 20,000

17.03.2016 T. V. purchased ₹ 70,000

25.03.2016 Interest paid ₹ 1,000

30.03.2016 Cheque paid to Mohan  
₹ 3,000

8. 'A' consigned 10 T. V. sets to "B" @ ₹ 10,000 each.

A spent ₹ 2,000 for loading expenses.

B spent ₹ 1,000 for unloading expenses and ₹ 2,000 for godown rent. B sold to T. V. set to customers at the rate of ₹ 13,000 each and is entitled to get 10% as commission. B sent ₹ 10,000 to A as advance.

Prepare Consignment A/c, B A/c and Goods Sent on Consignment A/c in the book of A.

9. From the following informations prepare Trading A/c and P/L A/c for the year ended 31.03.2016 and a Balance Sheet as on that date.

**Trial Balance**

<b>Particulars</b>	<b>₹</b>	<b>Particulars</b>	<b>₹</b>
Cash in hand	1,200	Capital	1,00,000
Purchases	1,20,000	Bill Payable	22,000
Stock Opening	35,000	Creditors	24,000
Debtors	50,000	Sales	2,00,000
Plant &		Bad Debt	
Machinery	60,000	Reserve	1,200
Furniture	15,000		
Bill Receivable	20,000		
Rent & Taxes	10,000		
Wages	16,000		
Salaries	20,000		
	3,47,200		3,47,200

**Adjustments :**

- (a) Closing Stock ₹ 40,000.
- (b) Outstanding Salaries ₹ 4,000.
- (c) Depreciation on Plant and Machinery at the rate of 5%.

ZI-31/3

(4)

Contd.

10. Write short notes on any **two** of the following :
- (a) Double Entry System
  - (b) Account Sale
  - (c) Cash Book
  - (d) Ledger

ZI - 31/3 (100)

(5)

BCA(II) — Bus. A/c  
(BC - 204)