BC — 201

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. (a) Define difference and symmetric difference of sets.

   (b) Let U = {a, b, c, d, e, f, g, h, k}, A = {a, b, c, g}, B = {d, e, f, g}, C = {a, c, f} and D = {f, h, k}. Compute (i) $A \oplus B$ (ii) $(A \cup B) - C$.

2. There are 40 students in a Discrete Mathematics class and 60 students in a Database Management class. Find the number of students which are either in Discrete Mathematics or Database Management class in the following cases :

   (a) The two classes meet at the same hour.

(b) The two classes meet at different hours and 20 students are enrolled in both the subjects.

3. Let R and S be relations on a set A. Then prove that :

(a) If R is reflexive then R^{-1} is also reflexive.

(b) If R and S are reflexive then $R \cap S$ and $R \cup S$ are reflexive.

4. (a) Define Function with example.

(b) If $f : A \to B$, $g : B \to C$ and $h : C \to D$, then show that $h \circ (g \circ f) = (h \circ g) \circ f$.

5. (a) Define semi-group, ring and field with example.

(b) Let G be a group and let a and b be the element of G. Then prove that :

(i) $(a^{-1})^{-1} = a$

(ii) $(ab)^{-1} = b^{-1}a^{-1}$

6. (a) Define Partition. And list all partition of the set A = {a, b, c}.

(b) Let X = {2, 3, 6, 12, 24, 36} and the relation <= be such that x <= y if x divides y. Draw the Hasse diagram for the given relation.

Contd.

7. (a) Define lattice with suitable example.

(b) If $(L_1, \leq)$ and $(L_2, \leq)$ are lattices then $(L_1 \times L_2, \leq)$ is a lattice and the partial order $\leq$ of L is the product partial order.

8. (a) What is meant by duality in Boolean algebra ? Explain.

(b) Demonstrate by means of truth tables the validity of the following theorems of Boolean algebra :

(i) The associative laws

(ii) De Morgan's theorem for three variables

9. (a) What is K-Map ? Explain don't care condition.

(b) Simplify the following Boolean Functions :

$F(A, B, C, D) = \Sigma(0, 1, 2, 5, 8, 9, 10)$

10. Write short notes on the following :

(a) Venn Diagram

(b) Semigroup and Subgroups

(c) Partially ordered set POSET

(d) Properties of lattices

BC –- 202

Shallai

2016

Time : 3 hours

Full Marks : 80

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The questions are of equal value.

*Answer any **five** questions.*

1. (a) Explain a decorder with diagram.

   (b) Explain SR and JK flip-flop.

2. (a) What is DMA ? Explain.

   (b) Explain 8-1 multiplexer.

3. (a) Explain, with example, any three addressing modes.

   (b) Give example of any Instruction format.

4. Explain the different memory mapping.

5. Explain Booth's algorithm with an example (for multiplication).

6. (a) Explain virtual memory.

   (b) Explain cache memory.

7. Explain floating point arithmetic operation with example.

8. (a) Explain any error defection technique.

   (b) Explain binary counter.

9. Draw the circuit with map simplification of $f(x) = \Sigma 2, 4, 6, 9.$

10. Write short notes on the following :

   (a) Data bus

   (b) Shift-register

BC — 203

2016

Time : 3 hours

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

The figures in the margin indicate full marks.

Answer any five questions.

1. Discuss different types of operator used in C language along with examples. 16

2. (a) Differentiate between do-while loop and while loop with the help of one example for each. 8

   (b) Explain difference between continue and break statement with example. 8

3. (a) What is the purpose of using functions in 'C' programming ? Differentiate declaration and definition of a function. 8

   (b) Explain the concepts of multidimensional arrays in 'C' language. 8

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4. Explain different string manipulation function with suitable examples. 16

5. (a) Briefly explain array of pointers. 8

(b) Write a program to swap two numbers using pointers. 8

6. Define a Structure. How it is different from union ? Explain the differences by giving suitable examples. 16

7. (a) Define the term "Data Structure". Explain the various operations of Queues. 8

(b) Explain OVERFLOW and UNDERFLOW condition on stacks. 8

8. Define a linked list. How a linear linked list is different from doubly linked list. Write an algorithm to insert and delete a node in a doubly linked list. 16

9. (a) Explain about Binary trees. 8

(b) Explain Binary search algorithm and compare it with Linear search algorithm. 8

BC — 301

Shalini

2016

Time : 3 hours

Full Marks : 80

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

The figures in the margin indicate full marks.

Answer any five questions.

1. (a) What is the role of MIS ? Explain the role of information system. 8

   (b) "MIS extends beyond computers and technology." Explain in your words. 8

2. (a) Explain classification of information. 8

   (b) Discuss the relevence and role of MIS in Rational decision-making process. 8

3. (a) Define the concept of Management. 8

   (b) Discuss the various categories of information with proper examples. 8

4. (a) What is the role of System Analyst ? 8

(Turn over)

(b) Briefly explain the phases involved in system design. 8

5. (a) What is DFD ? 8

(b) What do you understand by enterprise management system ? Explain. 8

6. (a) Explain briefly the various types of SAD with example. 8

(b) Explain the different levels of management. 8

7. (a) Differentiate between advantages of DBMS and conventional File Systems. 8

(b) What do you understand by group support systems ? 8

8. What are the different types of approaches available at the time of system design ? Explain all of them. 16

9. Write notes on the following : 16

(a) Unit testing

(b) Integration testing

10. Explain different types of hardware and software selection criteria. 16