La La Ciori

## 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.

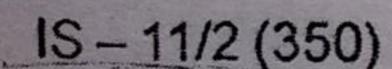
Answer any five questions.

- 1. (a) Define difference and symmetric difference of sets.
  - (b) Let  $U = \{a, b, c, d, e, f, g, h, k\}, A = \{0, b, c, g\}, B = \{d, e, f, g\}, C = \{a, c, f\} \text{ and } D = \{f, h, k\}.$ 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<sup>-1</sup> is also reflexive.
  - (b) If R and S are reflexive then R ∩ S and R ∪ S are reflexive.
- 4. (a) Define Function with example.
  - (b) If  $f: A \rightarrow B$ ,  $g: B \rightarrow C$  and  $h: C \rightarrow D$ , 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



Modicie

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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.
- 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  $f(x) = \sum 2, 4, 6, 9$ .
- 10. Write short notes on the following:
  - (a) Data bus
  - (b) Shift-register

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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.
    - (b) Explain difference between continue and break statement with example.
  - 3. (a) What is the purpose of using functions in 'C' programming? Differentiate declaration and definition of a function.
    - (b) Explain the concepts of multidimensional arrays in 'C' language.

(Tum over)

	plain different string manipulation fund	tion with
	able examples.  Briefly explain array of pointers.	8
J. (a)	Write a program to swap two number pointers.	ers using
Ex	fine a Structure. How it is different from plain the differences by giving stamples.	
	Define the term "Data Structure". Exp various operations of Queues.	lain the
(b)	Explain OVERFLOW and UNDER condition on stacks.	RFLOW 8
diff	fine a linked list. How a linear linked ferent from doubly linked list. Worthman to insert and delete a node in a sed list.	rite an
	Explain about Binary trees.  Explain Binary search algorith compare it with Linear search algor	

Malino

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Answer any five questions.

(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	1
Rational decision-making process.	3
3. (a) Define the concept of Management	3
(b) Discuss the various categories (	f
information with proper examples.	8
4. (a) What is the role of System Analyst?	8
(Tum ove	r)

	(b)	Briefly ex design.	plain the	e phases in	volved	in sys
5.	(a)	What is I	DFD?			
	(b)			nderstand tem? Expla		erpris
6.	(a)	Explain be example.		various typ	es of S	AD with
	(b)	Explain.tl	he differe	nt levels of r	nanage	ment8
7.	(a)			een advanta File System		DBMS 8
	(b)	What do systems		erstand by	group si	upport 8
8.	ava			nt types of system de		
9.	(a)	te notes or Unit testir	ng	wing:		16
		Integratio				
10.	Exp	lain differe	nt types	of hardware	and so	ftware
	sele	ection crite	ria.			16
TO	-5/1	(350)	(2	)	BC-	-301

TO-5/1 (350)