

3 (Sem-1) CSC M 1

2014

COMPUTER SCIENCE

( Major )

Paper : 1.1

( Computer Fundamentals and Programming )

Full Marks : 60

Time : 2½ hours

*The figures in the margin indicate full marks for the questions*

1. Answer the following questions : 1×10=10

- (a) Draw a block diagram of a computer to show its various parts.
- (b) Define an algorithm.
- (c) List various data types in C.
- (d) What is the purpose of assignment statement?
- (e) What is the utility of "&" in scanf() function?
- (f) List the logical operators used in C.

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( Turn Over )

( 2 )

- (b) If the current flowing through a  $p-n$  junction diode increases ten times, what is the increase in diode voltage? Assume forward biased silicon diode operating at room temperature. 5+5=10
3. Considering three logic variables  $A$ ,  $B$  and  $C$ , write the fundamental properties of Boolean algebra. 10
4. (a) State and prove De Morgan's theorem.  
(b) Prove the following Boolean identities :  
(i)  $AB + A\bar{B} = A$   
(ii)  $A(A + B) = A$  10
5. Find the POS and SOP forms of the following expression :  
$$X = \sum m(0, 1, 3, 6, 7, 8, 13, 15)$$
  
Which one is more cost-effective? 10
6. What is the shortcoming of an S-R flip-flop? Explain how this shortcoming is removed in J-K flip-flop. 10
7. Write short notes on (any two) : 5×2=10  
(a) Phototransistor  
(b) Full adder  
(c) N-type semiconductor  
(d) Registers

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