

F.Y.B.Sc. (I.T.)

Paper – 102: Mathematics and Foundation of IT

Time: 3 Hours

*April - 2016 - 8058*

Total Marks: 100

- Q.1 (a) Describe various applications of information technology. [10]  
(b) Write a detail note on 'Types of Software'. [10]

OR

- Q.1 (a) Explain different kind of programming languages in detail. [10]  
(b) Write a short note on Nature and Qualities of Software. [10]

- Q.2 Explain: (i) Characteristics of computer [20]  
(ii) Types of memory

OR

- Q.2 (a) Discuss about generations of computer. [10]  
(b) Explain any three secondary storage devices. [10]

- Q.3 (a) Explain format / structure of an HTML program and give one example. [10]  
(b) Explain any five commonly used HTML tags with example. [10]

OR

- Q.3 (a) Explain HTML tags useful for (i) Text style (ii) Text effect. [10]  
(b) Differentiate between Web client and Web server. [10]

- Q.4 (a) Convert: (i)  $(1010101)_2$  to Decimal and Octal. [10]  
(ii)  $(8B06)_{16}$  to Binary and Decimal  
(iii)  $(6210)_8$  to Binary and Hexadecimal.  
(b) Explain Binary division with suitable example. [10]

OR

- Q.4 (a) What is the result of [10]  
(i)  $(111)_2 * (100)_2$  in Decimal  
(ii)  $(1111)_2 / (11)_2$  in Octal  
(iii)  $(100111)_2 + (10011)_2 + (10101)_2$  in Hexadecimal ?  
(b) What is the role of ASCII and EBCDIC character codes in computer? [10]

- Q.5 (a) Define: (i) Subset (ii) Union of two sets (iii) Difference of two sets [10]  
(iv) Even function (v) One – one function.

(b) Let  $A = \{1, 2, 3, 4, 5\}$ ,  $B = \{2, 5, 8, 10, 13\}$ . Find [10]

(i)  $A \cup B$  (ii)  $A \cap B$  (iii)  $A \times B$  (iv)  $A - B$ .

**OR**

Q.5 (a) Let  $A = \{1, 3, 5, 7, 8, 10\}$ ,  $B = \{2, 3, 4, 7, 9\}$ ,  $C = \{1, 2, 4, 6, 7, 10\}$ . [10]

Verify (i)  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

(ii)  $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

(b) Consider functions  $f : \mathbb{R} \rightarrow \mathbb{R}$  and  $g : \mathbb{R} \rightarrow \mathbb{R}$  defined as  $f(x) = 2x + 5$  and  $g(x) = x^2 - 1$ . Find  $g(-3)$ ,  $g(2)$ ,  $f(0)$ ,  $f(2/3)$ ,  $f(2) + g(3)$ . [10]

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