2011

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 **five** questions, selecting **two** questions from each Group and Q. No. 1 is compulsory.*

1. Indicate the correct answer : 2×8 = 16

(a) If u = { 1, 2, 3, 4, 5 } and A = { 1, 5 }, then :

(i) A^C = { 1, 3, 5 }

(ii) A^C = { 2, 5, 4 }

(iii) A^C = { 1, 5 }

(iv) None of these

(b) If A = { −2, 0, 1, 2 } and B = { 1, 2, 3, 4 }, then A − B will be

(i) { −2, 0 }

(ii) $\{-2, 0, 1, 2\}$

(iii) $\{1, 2, 3, 4\}$

(iv) None of these

(c) If the number of elements in two sets A and B are 'm' and 'n' respectively then the number of distinct relations from A to B is

(i) 2^{m+n}

(ii) 2^{mn}

(iii) 2^{m}

(iv) None of these

(d) Find $[-7.6]$

(i) -7

(ii) -8

(iii) 7

(iv) None of these

(e) The sequence of numbers is given as $S = 1, -1, 1, -1, -, \ldots\ldots$ Find a_n (n th term)

(i) $(-1)^n$

(ii) $(-1)^{n-1}$

(iii) $(-1)^{n+1}$

(iv) None of these

(f) Find the number of terms in the expansion $(2x + 3y - 5z)^8$:

(i) 65

(ii) 45

(iii) 24

(iv) None of these

(g) Find the generating function for the sequence (1, 1, 1, 1, 1, 1) :

(i) $\frac{x^5 - 1}{x - 1}$

(ii) $1 + \frac{x^5}{x - 1}$

(iii) $x^6 - \frac{1}{x - 1}$

(iv) None of these

(h) The system of recording transactions based on dual aspect concept is called :

(i) Double Account System

(ii) Double Entry System

(iii) Single Entry System

(iv) None of these

Group – A

2. Define the terms set, subset, cartesian product of sets.

   If U = { 1, 2, 3, 4, 5, 6 }, A = { 1, 2, 3, 4 } and B = { 3, 4, 5, 6 }, find the bit string for the set A and B. Using bit string, determine the complement of A. Also find the union and intersection of A and B.

   16

3. (a) Draw block diagrams and truth tables for NAND, NOR and XOR gates.

   (b) If $\star$ is defined as $X \star Y = X' + Y$ and $Z = X \star Y$, find $Z \star X$.

   10+6 = 16

4. (a) Explain the importance of k-map.

   (b) Simplify the following expression using k-map:

   8+8 = 16

   $F(A, B, C) = \Pi (0, 1, 2, 4, 5)$

5. (a) Prove by induction that the number of diagonals in a polygon of n sides is $\frac{n(n-3)}{2}$

(b) Let f and g be the functions from the set of integers defined by $f(x) = 2x + 3$ and $g(x) = 3x + 2$. Determine the compositions of f and g and g and f. 8+8 = 16

Group – B

6. Explain Ledger. Differentiate between manual accounting and computerized accounting. What is the relationship between ledger and journal ? 16

7. What is Tally ? Explain its features. Explain what you know about vouchers for the transaction. 16

8. What is inventory ? Explain briefly the types of inventory vouchers. 16

9. Write short notes on the following : 16

(a) ODBC

(b) E-mail

(c) Web-Browser

(d) Budget