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Affiliated to Saurashtra University, Rajkot

SEMESTER END EXAMINATION NOVEMBER – 2016**B.Voc. Applied Computer Technology****ACTECH 1.3 – FOUNDATION OF SPEED MATHEMATICS & STATISTICS***Duration of Exam – 3 hrs**Semester – I**Max. Marks – 70***Que. - 1 Answer the following Questions****[20]**

1. If $X = \{0, 1\}$, how many subsets are possible ?
2. Which symbol is used for Null Set
3. $A \cup A' = \dots\dots\dots$
4. If $A = \{-1, 1, 2\}$ then what type of presentation (tabular form / Set builder form)
5. Write any one of the demorgen's Law
6. $A = \{0, 2, 3\}$ and $B = \{0, 1, 4\}$, $A \cap B = \dots\dots\dots$
7. If $A = B$ then All elements of A and B are $\dots\dots\dots$
8. In Matrix $B^t + A^t = \dots\dots\dots$
9. In a Zero Matrix all elements are $\dots\dots\dots$
10. Identity Matrix is denoted by $\dots\dots\dots$
11. If $BC = I$ then C is Called $\dots\dots\dots$ of B
12. In which matrix all diagonal elements are equal and remaining are zero (identity / Scalar)
13. If $A = \begin{bmatrix} 2 & -4 \\ -2 & 0 \end{bmatrix}$, find transpose of A
14. $A = [3 \ 5 \ -1 \ 6]$ what is the order of matrix A
15. When two line are perpendicular then slope of lines are $\dots\dots\dots$
16. Write a equation of line having slope 10 and intercept on y axis is 3
17. When area is zero . Given three points are $\dots\dots\dots$
18. $(11)_{10} = ()_2$
19. $(1001)_2 = ()_{10}$
20. $(320)_8 = ()_{10}$

Que. – 2 (A) Answer the following Questions (Any Three)**[06]**

1. Explain any one method to represent a set
2. Define : Union of Two Sets , Complimentary of a Set
3. Define : Symmetric matrix with an example
4. If $A = \begin{bmatrix} 5 & 2 \\ 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 1 \\ 2 & 3 \end{bmatrix}$ Find $(A + B)^t$
5. $B = [1 \ 2 \ 3]$ and $A = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ Find BA
6. $A = \{a, c, b\}$ find $A \times A$

Que. – 2 (B) Answer the following Questions (Any Three)**[09]**

1. Define intersection of sets and write properties of intersection
2. $A = \{ 2, 4, 6 \}$ $B = \{ -1, 0, 2 \}$ find $A \times B$ and $B \times A$
3. If $A = \{ 1, 2, 4, 5, 6 \}$ and $B = \{ 2, 3, 4, 5, 7, 8 \}$, $C = \{ 1, 3, 4, 5, 7 \}$ Find $A \cup (B \cap C)$
4. $A = \begin{bmatrix} 5 & 6 \\ 3 & -2 \end{bmatrix}$ $B = \begin{bmatrix} -2 & -4 \\ 0 & 3 \end{bmatrix}$ Find $2A - 3B$
5. $A = \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix}$ Find B such that $A + B = 3A$
6. Find the distance between two points $(2, -5)$ and $(3, 4)$

Que. – 2 (C) Answer the following Questions (Any Two)**[10]**

1. For any three sets prove that $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
2. Verify $(3, 2)$, $(5, 4)$, $(3, 6)$, $(1, 4)$ are the vertices of a square
3. Find equation of line makes equal intercept on both axes & passing through the point $(16, -5)$.

4. If $A = \begin{pmatrix} 3 & 4 & 5 \\ 6 & 7 & 8 \\ 1 & 2 & 1 \end{pmatrix}$ find inverse of A

5. $A = \begin{bmatrix} 2 & -26 \\ 3 & -10 \end{bmatrix}$ $B = \begin{bmatrix} 2 & 4 \\ 1 & 3 \end{bmatrix}$ find $\text{Adj}(AB)$

Que. – 3 (A) Answer the following Questions (Any Three)**[06]**

1. Write a formula for distance between two points
2. Write a equation of line passing through two points
3. Explain five more rule technique
4. Convert these numbers from binary to decimal $(1010101)_2 = ()_{10}$
5. Convert $(24)_{16}$ to decimal
6. Find 2's Complement of 10110

Que. – 3 (B) Answer the following Questions (Any Three)**[09]**

1. Explain : decimal number system , hexa decimal system
2. Explain in brief skills to improve memory
3. The co-ordinates of two points A & B are $(3, 3)$ & $(-3, 7)$ respectively, find slope & equation of line.
4. Convert these numbers from Decimal to Hexadecimal $(2500)_{10} = ()_{16}$
5. Find a point which divides the line joining $(1, 2)$ & $(2, 6)$ internally in the ratio 2:3
6. Write Advantages of meditation

Que. – 3 (C) Answer the following Questions (Any Two)**[10]**

1. Explain different techniques for Mind Control
2. Write a short note on Visualization Technique.
3. Subtract following numbers by 1's compliment method
 $(101101)_2 - (01101)_2$
4. Convert Octal to binary
(1) $(521)_8$ (2) $(8985)_8$
5. Find Equation of Straight line passing through point $(10, 10)$ and parallel to line $4x - 7y + 20 = 0$