SECTION – B

II. Answer **any six** of the following. **Each** question carries **5** marks. **(6×5=30)**

13) If A = {1, 4}, B = {2, 3, 6}, C = {2, 3, 7}. Then verify that $A\times(B - C) = (A\times B) - (A\times C)$.

14) Show that $f : R\to R$ given by $f(x) = 4x + 3$ is invertible and find the inverse of f.

15) Write the converse, inverse and contrapositive of "If three sides are equal then the triangle is an equilateral triangle".

16) Find the inverse of $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$.

17) Using Cramer's rule solve $x + y + z = 7$

$2x + 3y + 2z = 17$

$4x + 9y + z = 37$.

18) Verify Cayley - Hamilton theorem for $A = \begin{bmatrix} 1 & 4 \\ -2 & 3 \end{bmatrix}$.

19) Find the eigenvalues and eigenvectors of $A = \begin{bmatrix} 4 & 1 \\ -1 & 2 \end{bmatrix}$.

20) Prove that $(p \leftrightarrow q) \equiv (p \to q) \wedge (q \to p)$.

SECTION – C

III. Answer **any six** of the following. **Each** question carries **5** marks. **(6×5=30)**

21) If $\log(a + b) = \frac{1}{2}\log(3ab)$. Show that $a^2 + b^2 = ab$.

22) In how many ways 3 boys and 5 girls can be arranged so that

i) No two boys are together

ii) All girls are together.

23) How many different words can be formed with the letters of the word 'MISSISSIPPI' ? In how many of these 'I' does not come together ?