Assignment 2

EE24BTECH11002 - Agamjot Singh

20) Let a, b, c be such that $b(a+c) \neq 0$ if
$$\begin{vmatrix} a & a+1 & a-1 \\ b & b+1 & b-1 \\ c & c-1 & c+1 \end{vmatrix} + \begin{vmatrix} a+1 & b+1 & c-1 \\ a-1 & b-1 & c+1 \\ (-1)^{n+2}a & (-1)^{n+1}b & (-1)^n c \end{vmatrix} = 0,$$ then the value of n is:

(a) any even integer (b) any odd integer

(c) any integer (d) zero

21) The number of 3×3 non-singular matrices with four entries as 1 and all othe entries as 0, is

(a) 5 (b) 6

(c) atleast 7 (d) less than 4

22) Let A be a 2×2 matrix with non-zero entries and let $A^2 = I$, where I is 2×2 identity matrix. Define
Tr(A) - sum of diagonal elements of A and
$|A|$ - determinant of matrix A.
Statement - 1: Tr(A) = 0.
Statement - 2: $|A| = 1$

(a) Statement - 1 is true, Statement - 2 is true; Statement - 2 is **not** a correct explanation for Statement-1.
(b) Statement - 1 is true, Statement - 2 is false.
(c) Statement - 1 is false, Statement - 2 is true.
(d) Statement - 1 is true, Statement - 2 is true; Statement - 2 is a correct explanation for Statement-1.

23) Consider the system of linear equations;
$$\begin{aligned} x_1 + 2x_2 + x_3 &= 3 \\ 2x_1 + 3x_2 + x_3 &= 3 \\ 3x_1 + 5x_2 + 2x_3 &= 1 \end{aligned}$$

(a) exactly 3 solutions
(b) a unique solution
(c) no solution
(d) infinite number of solutions

24) The number of values of k for which the linear equations $4x + ky + 2z = 0$, $kx + 4y + z = 0$ and $2x + 2y + z = 0$ posses a non zero solution is (2011)

(a) 2 (b) 1 (c) zero (d) 3