Q1. 21 January Shift 2

If the system of equations
$3x + y + 4z = 3$
$2x + \alpha y - z = -3$
$x + 2y + z = 4$
has no solution, then the value of α is equal to :
(1) 19 (2) 4 (3) 13 (4) 23

Q2. 22 January Shift 2

Let n be the number obtained on rolling a fair die. If the probability that the system
$x - \mathrm{n}y + z = 6$
$x + (\mathrm{n}-2)y + (\mathrm{n}+1)z = 8$
$(\mathrm{n}-1)y + z = 1$ has a unique solution is $\frac{k}{6}$,
then the sum of k and all possible values of n is :
(1) 20 (2) 24 (3) 21 (4) 22

Q3. 23 January Shift 1

Among the statements :
I: If $\begin{vmatrix} 1 & \cos\alpha & \cos\beta \\ \cos\alpha & 1 & \cos\gamma \\ \cos\beta & \cos\gamma & 1 \end{vmatrix} = \begin{vmatrix} 0 & \cos\alpha & \cos\beta \\ \cos\alpha & 0 & \cos\gamma \\ \cos\beta & \cos\gamma & 0 \end{vmatrix}$, then $\cos^2\alpha + \cos^2\beta + \cos^2\gamma = \frac{3}{2}$, and
II : If $\begin{vmatrix} x^2+x & x+1 & x-2 \\ 2x^2+3x-1 & 3x & 3x-3 \\ x^2+2x+3 & 2x-1 & 2x-1 \end{vmatrix} = \mathrm{p}x + \mathrm{q}$, then $\mathrm{p}^2 = 196\mathrm{q}^2$,
(1) only II is true (2) both are false
(3) both are true (4) only I is true

Q4. 23 January Shift 2

The system of linear equations
$x + y + z = 6$
$2x + 5y + az = 36$
$x + 2y + 3z = b$
has
(1) unique solution for $a = 8$ and $b = 16$ (2) infinitely many solutions for $a = 8$ and $b = 16$
(3) unique solution for $a = 8$ and $b = 14$ (4) infinitely many solutions for $a = 8$ and $b = 14$

ANSWER KEYS

1. (1) **2.** (4) **3.** (2) **4.** (4)