



Q.1. Solve the following:

(6x5=30)

- 1) Find the 9th term of the harmonic sequence $\frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \dots$
- 2) Find the 6th term in the expansion of $(x^2 - \frac{3}{2x})^{10}$
- 3) If $a_n = (-1)^n(2n - 3)$, then find first four terms of the sequence.
- 4) If $y = 1 + \frac{x}{2} + \frac{x^2}{4} + \dots \infty$, then show that $x = 2\left(\frac{y-1}{y}\right)$
- 5) Find r , when $l = 56cm$ and $\theta = 45^\circ$
- 6) Find the value of λ if $\begin{bmatrix} 4 & \lambda & 3 \\ 7 & 3 & 6 \\ 2 & 3 & 1 \end{bmatrix}$ is singular.

Solve the following:

(5x6=30)

Q.2 If n is prime, then show that \sqrt{n} is irrational number. Write first five prime numbers. (10)

Q.3 If the matrices $\begin{pmatrix} 3 & -2 & -2 \\ -1 & 1 & 1 \\ 3 & -1 & -2 \end{pmatrix}$ and $\begin{pmatrix} 1 & a & 0 \\ -1 & b & 1 \\ 2 & c & -1 \end{pmatrix}$ are inverses of each other, what is the value of c . (10)

Q.4 If A, G and H are arithmetic, geometric and harmonic means, then $\frac{G}{H} = \frac{A}{G}$ (10)