2023-April-10 Shift-1

AI24BTECH11005 - Prajwal Naik

16) An arc PQ of a circle subtends a right angle at the centre O. The midpoint of the arcPq is R.If $\overrightarrow{OP} = \overrightarrow{u}$ and $\overrightarrow{OR} = \overrightarrow{v}$ and $\overrightarrow{OQ} = \alpha \overrightarrow{u} + \beta \overrightarrow{v}$, then α, β^2 are the roots of the

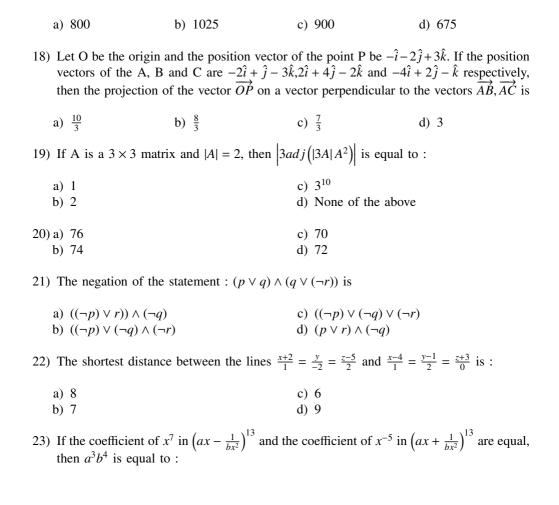
17) A square piece of tin of side 30 cm is to be made into a box without top by cutting a square from each corner and folding up the flaps to form a box. If the volume of the

box is maximum, then its surface area is equal to:

c) $x^2 - x - 2 = 0$ d) $x^2 + x - 2 = 0$

equation:

a) $3x^2 - 2x - 1 = 0$ b) $3x^2 + 2x - 1 = 0$



| 24) A line segment AB of length λ moves such that the points A and B remain on the periphery of a circle of radius λ. The locus of the point, that divides the line segment AB in the ratio 2:3, is a circle of radius : | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------|-------------------------|
| a) $\frac{2}{3}\lambda$ b) $\frac{\sqrt{19}}{7}\lambda$ | | c) $\frac{3}{5}\lambda$ d) $\frac{\sqrt{19}}{5}\lambda$ | |
| 25) For the system of linear equations $2x - y + 3z = 5$ 3x + 2y - z = 7 $4x + 5y + \alpha z = \beta$ Which of the following is not correct? | | | |
| $\beta = 8$ | nconsistent for $\alpha = -5$, infinitely many solu- $5, \beta = 9$ | $\alpha = -5, \beta = 8$ | • |
| 26) Let the first term a and the common ratio r of a geometric progression be positive integers. If the sum of squares of its first three is 33033, then the sum of these terms is equal to : | | | |
| a) 210 | b) 220 | c) 231 | d) 241 |
| 27) Let P be the point of intersection of the line $\frac{x+3}{3} = \frac{y+2}{1} = \frac{z-1}{-2}$ and the plane $x+y+z=2$. If the distance of the point P from the plane $3x-4y+12z=32$ is q, then q and 2q are the roots of the equation: | | | |
| a) $x^2 + 18x - 72 =$ | $0 b) x^2 + 18x + 72 = 0$ | c) $x^2 - 18x - 72 = 0$ | d) $x^2 - 18x + 72 = 0$ |

28) Let f be a differentiable function such that $x^2 f(x) - x = 4 \int_0^4 t f(t) dt$. $f(1) = \frac{2}{3}$. Then

29) Let N denote the sum of the numbers obtained when two dice are rolled. If the

probability that $2^{N!} < N!$ is $\frac{m}{n}$. Where (m, n) = 1, then 4m - 3n equal to:

30) If $I(x) = \int_{e}^{\sin x^2} (\cos x \sin 2x - \sin x) dx$ and I(0) = 1, then $I(\frac{\pi}{3})$ is equal to :

c) 210

c) 210

d) 160

d) 160

c) 11

d) 33

a) 22

b) 44

18f(3) is equal to:

a) 180

a) 180

b) 150

b) 150

3