

**(1) Number of ways to choose even number or two odd numbers from 4 even numbers and 5 odd numbers equals .....**

(a)  ${}^4C_1 \times {}^5C_2$

(b)  ${}^4P_1 \times {}^5P_2$

(c)  ${}^4P_1 + {}^5P_2$

(d)  ${}^4C_1 + {}^5C_2$

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**(2) If two straight lines  $\overleftrightarrow{xx}$ ,  $\overleftrightarrow{yy}$  forming a plane its equation...**

(a)  $xy = 0$

(b)  $x = 0$

(c)  $y = 0$

(d)  $z = 0$

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**(3) The conjugate of the number  $1 + \omega$  is .....**

(a)  $-\omega$

(b)  $\omega^2$

(c)  $1 - \omega$

(d)  $1 - \omega^2$

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**(4) Point which lie on the straight line  $\vec{r} = (2, -1, 3) + t(1, 2, -1)$  is ...**

(a) (1, 1, 1)

(b) (3, 1, 2)

(c) (4, -3, 0)

(d) (0, 2, -2)

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(5)  ${}^7C_r : {}^7C_{r-1} = 1 : 3$

- (a) 4
- (b) 5
- (c) 6
- (d) 7

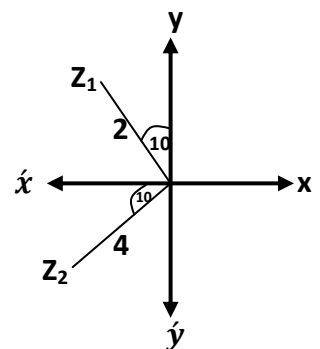
(6) If equations of two spheres are:  $(x - 2)^2 + (y + 4)^2 + (z - 2)^2 = 1$ ,  $(x^2 + 4)^2 + (y - 4)^2 + (z - 2)^2 = 4$ , then two spheres are .....

- (a) intersecting
- (b) disjoint
- (c) touched externally
- (d) touched internally

(7) In the opposite figure:

The principal amplitude of number  $\frac{z_1}{z_2}$  is .....

- (a)  $\frac{\pi}{9}$
- (b)  $-\frac{\pi}{9}$
- (c)  $-\frac{\pi}{2}$
- (d)  $\frac{\pi}{2}$



(8) If straight line  $L_1: \frac{x+2}{-1} = \frac{y+3}{3} = \frac{z+5}{2}$  perpendicular to the St. line

$L_2: \frac{x}{2} = \frac{y-5}{k} = \frac{z-6}{m}$  then  $3k + 2m = \dots\dots\dots$

- (a) -2
- (b) 2
- (c) 3
- (d) 4

(9) In the expansion of  $(1 + x)^n$ , if  $T_3$  is a geometrical mean between  $T_2$ ,  $T_5$ . Find  $n$  at  $x = \frac{9}{5}$ .

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(10) Find measure angle between two straight lines:

$$L_1: 2x = 3y - 1 = z - 3, \vec{r} = (2, -1, 5) + t(-1, 1, 2)$$

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(11) Without expanding find value of  $K$  if  $x - 1$  is a factor of the determinant:

$$\begin{vmatrix} x - 1 & 1 & 1 \\ 1 & 1 & x + 1 \\ -1 & 1 & x + k \end{vmatrix}$$

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(12) In the exp. Of  $(1+ ax)^7$  if coefficient of  $T_5 = 560$ , then  $a = \dots$

(a)  $\pm 2$

(b)  $\pm 4$

(c) 2

(d) 4

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(13) If  $\overrightarrow{AB} = -3\vec{i} + 3\vec{j} + 7\vec{k}$ ,  $\overrightarrow{BC} = \vec{j} + 5\vec{k}$ , then  $\|\overrightarrow{AC}\| = \dots\dots\dots$

(a) 9

(b) 10

(c) 12

(d) 13

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(14) Discuss the ability of solving the following equations then find S.S. if it exists.

$$\begin{pmatrix} 1 & 1 & 1 \\ 2 & -3 & 2 \\ 1 & -1 & 0 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 3 \end{pmatrix}$$

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(15) If plane  $2x - y - 2z + 12 = 0$  cuts sphere:

$(x+3)^2 + (y + 2)^2 + (z - 1)^2 = 15$ . Find area of the cross section.

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(16) If plane  $\frac{x}{4} + \frac{y}{2} + \frac{z}{2} = 1$  cut axes at points a, b, c then area of  $\Delta ABC =$  ..... Unit area.

- (a) 12
- (b) 10
- (c) 6
- (4) 4

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(17) If  $Z^3 = -i$  then roots of the equation are:

- (a)  $-i, -\frac{\sqrt{3}}{2} - \frac{1}{2}i, \frac{\sqrt{3}}{2} - \frac{1}{2}i$
- (b)  $-i, -\frac{\sqrt{3}}{2} + \frac{1}{2}i, \frac{\sqrt{3}}{2} - \frac{1}{2}i$
- (c)  $, -\frac{\sqrt{3}}{2} + \frac{1}{2}i, \frac{\sqrt{3}}{2} - \frac{1}{2}i$
- (d)  $i, -\frac{\sqrt{3}}{2} - \frac{1}{2}i, \frac{\sqrt{3}}{2} - \frac{1}{2}i$

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(18) Answer one of the following:

- (a) Find vector components for  $\overrightarrow{AB}$  where A (2, 1, 0), B (3, 1,  $\sqrt{3}$ ) in direction of  $\overrightarrow{M}$  where  $\overrightarrow{M} = (3, 2, 2\sqrt{3})$
- (b) Find volume of parallelepiped in which three non – parallel edges are represented by vectors  $\overrightarrow{A} = (3, -4, 1), \overrightarrow{B} = (0, 2, -3), \overrightarrow{C} = (3, 2, 2)$ .

**(19) Answer one of the following:**

**(a) If  $Z = e^{\theta i}$ , then find module and principal amplitude for the number  $\frac{1+z}{1-z}$**

**(b) If  $|Z_1| = |Z_2| = 1$ ,  $\arg. (Z_1 Z_2^3) = 81$ ,  $\arg. \left(\frac{Z_1}{Z_2}\right) = 33^\circ$ . Find number  $(Z_1 Z_2)^{15}$  in form of  $x + i y$**