

**First : Choose the correct answer from those given:**

(١) If  $Z = -1 + \sqrt{3}i$ , then the exponential form of the number  $Z$  is .....

(a)  $Z = 2 e^{-\frac{\pi}{3}i}$

(b)  $Z = 2 e^{\frac{\pi}{3}i}$

(c)  $Z = 2 e^{\frac{2\pi}{3}i}$

(d)  $Z = 2 e^{-\frac{2\pi}{3}i}$

(٢) If  $Z = a + bi$  and  $|Z| = |Z - \xi|$ , then  $a = \dots\dots\dots$

(a) ١

(b) ٢

(c) ٤

(d) ٨

(٣)  $(1 + 2\omega + \frac{1}{\omega^2})(1 + 2\omega + \frac{1}{\omega^2}) = \dots\dots\dots$

(a) zero

(b) -١

(c) ٢

(d) ١

(( بقية الأسئلة في الصفحة الثانية ))

(٤) A student should answer ١٠ questions out of ١٣ questions on condition that he answers ٤ questions at least from the first five questions. By how many methods can the student answer the questions?

(a) ١٤٠

(b) ١٩٦

(c) ٢٨٠

(d) ٣٤٦

(٥) If  ${}^{n+r}C_r = {}^nC_r$ , then  $n = \dots\dots\dots$

(a) ٤

(b) ٦

(c) ٨

(d) ١٠

(٦) In the expansion of  $(1+x)^{27}$ , if the ratio between the two middle terms is ٣ : ١, then  $x = \dots\dots\dots$

(a) ٤

(b)  $\frac{1}{4}$

(c)  $\frac{1}{3}$

(d) ١

(( بقية الأسئلة في الصفحة الثالثة ))

(٧) The length of perpendicular drawn from the point  $(-2, 3, 4)$  to the  $x$ -axis equals ..... length unit.

- (a) 2                      (b) 3                      (c) 4                      (d) 0

(٨) If the two vectors  $(2, k, -3)$ ,  $(4, 6, -6)$  are parallel, then  $k = \dots\dots\dots$

- (a) 6                      (b) 3                      (c) -3                      (d) 1

(٩) The equation of the sphere whose centre is the origin and passes by the point  $(3, -1, 2)$  is .....

- (a)  $x^2 + y^2 + z^2 = \sqrt{14}$   
(b)  $x^2 + y^2 + z^2 = 14$   
(c)  $(x - 3)^2 + (y + 1)^2 + (z - 2)^2 = \sqrt{14}$   
(d)  $(x - 3)^2 + (y + 1)^2 + (z - 2)^2 = 14$

(( بقية الأسئلة في الصفحة الرابعة ))

(١٠) The equation of the of the straight line which passes by the two points:

A  $(1, -1, 2)$ , B  $(-1, 0, 1)$  is .....

$$(a) \frac{x-1}{2} = \frac{y+1}{-1} = \frac{z-2}{1}$$

$$(b) \frac{x+1}{-2} = \frac{y}{1} = \frac{z-2}{-1}$$

$$(c) \frac{x-2}{2} = \frac{y+1}{3} = \frac{z-1}{2}$$

$$(d) \frac{x-1}{1} = \frac{y+1}{3} = \frac{z-2}{3}$$

(١١) The length of the perpendicular drawn from the point  $(2, 3, 1)$  to the plane  $2x - 2y + z = 0$  equals ..... length unit.

(a) 4

(b) 3

(c) 2

(d) 1

(١٢) If the plane :  $\frac{x}{4} + \frac{y}{2} + \frac{z}{2} = 1$  intersects the coordinate axes at the points A , B and C respectively , then the area of the triangle ABC = ..... unit of area

(a) 12

(b) 10

(c) 6

(d) 4

(( بقية الأسئلة في الصفحة الخامسة ))

-٥-

E ١٣١٠ / أول (تابع) (ث . ع / دمج)

**Second : Answer the following questions :**

(١) In the expansion of  $(x + \frac{3}{2x^2})^{12}$ , find :

(i) Coefficient of  $x^1$

(ii) The value of the term free of  $x$ .

(( بقية الأسئلة في الصفحة السادسة ))

-٦-

E ١٣١٠ / أول (تابع) (ث . ع / دمج)

(٢) Put the number  $z = 1 + \sqrt{3}i$  in the trigonometric form , then find its two square roots in the exponential form.

(( بقية الأسئلة في الصفحة السابقة ))

-٧-

١٣١٠ E / أول (تابع) (ث . ع / دمج)

(٣) Without expanding the determinant, prove that:

$$\begin{vmatrix} y & x & x+y \\ y+3 & 3 & y \\ 3 & x+3 & x \end{vmatrix} = 12xy$$

(( بقية الأسئلة في الصفحة الثامنة ))

-٨-

١٣١٠ E / أول (تابع) (ث . ع / دمج)

(٤) Find the volume of the parallelepiped in which three adjacent sides are represented by the vectors:  $\vec{A} = (1, 1, 3)$ ,  $\vec{B} = (2, 1, 4)$  and  $\vec{C} = (5, 1, -2)$ .

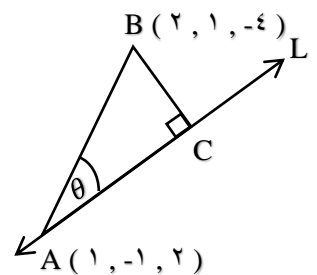
(( بقية الأسئلة في الصفحة التاسعة ))

-٩-

١٣١٠ E / أول (تابع) (ث . ع / دمج)

(٥) Find the length of the perpendicular drawn from the point  $(2, 1, -4)$  to the straight line

$$\vec{r} = (1, -1, 2) + k(2, 3, -2)$$





(( بقية الأسئلة فى الصفحة العاشرة ))

- ١٠ -

١٣١٠ E / أول (تابع) (ث . ع / دمج)

(٦) Find the vector form and the general form of the equation of the plane which passes by the points: A ( ٢ , -١ , ٠ ) , B ( -١ , ٣ , ٤ ) , C ( ٣ , ٠ , ٢ ) .

(( بقية الأسئلة في الصفحة الحادية عشر ))

E ١٣١٠ / أول (تابع) (ث . ع / دمج) -١١-

(٧) Solve the following equations using the inverse matrix:

$$x + 2y - 3z = 1 \quad , \quad x + y + z = 7 \quad , \quad 3x + y - z = 9$$





