Arab Republic of Egypt **Subject: Algebra & Analytic Geometry**

Ministry Of Education **Time Allowed: Two Hours**

Experimental Test for third secondary stage 2017/2018

Answer the following questions:-

(1) If ${}^{n}C_{r} : {}^{n}P_{r} = \frac{1}{6}$ then $\lfloor r-3 \rfloor$ = ……

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

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(2) The last term in the expansion of $(2-x)^5\,(2+x)^5$ according to the ascending power of x is ……..

(a) x^5 (b) $-x^5$ (c) x^{10} (d)$-x^{10}$

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(3) The length of the perpendicular drawn from point (1 , -3 , 4) to the x- axis equals ……..length unit.

(a) 1 (b) 3 (c) 4 (d) 5

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(4) The measure of the acute angle between the two vectors (0 , - b , b) , (b , – b , 0) equals …….^{o} where b is a constant ≠ 0

(a)30 (b) 45 (c)60 (d) 90

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(5) Answer one of the following items:

In the expansion of $\left(x^2+\frac{1}{x}\right)^{12}$ according to the descending power of x .

(a) Find the ratio between the term free of x and the coefficient of the eighth term.

(b) Find the ratio between the coefficient of the middle term and the coefficient of the 10^{th} term

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(6) Find the principle amplitude of the complex number $z = -1 - i$

(a) $\frac{\pi}{4}$ (b) $\frac{3\pi}{4}$ (c) $\frac{-3\pi}{4}$ (d) $\frac{5\pi}{4}$

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(7) The value of: $\left(\frac{1}{1+\omega i}-\frac{\omega+i}{1+\omega^2 i}\right)^8$ = ...

(a) 16 (b) 8 (c) $16i$ (d) $8i$

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(8) Without expanding the determinant,

Solve the following equation : $\begin{vmatrix} 3x & 2x & x \\ x & 2x & 3x \\ x & -x & 0 \end{vmatrix} = 96$

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(9) The number of the solutions of the system: $3x + 2y = 4$, $2x + 3y = 6$ is…….

(a) Zero (b) 2 (c) 1 (d) infinite number of solutions

(10) If the middle term of the expansion of: $\left(\frac{x}{3} + \frac{3}{x}\right)^{2n}$ is the seventh term, then n = …….

(a) 6 (b) 7 (c) 12 (d) 14

(11) The volume of the parallelepiped in which three adjacent sides of it are represented by the vectors $\vec{A}$=(0 , 0 , 2) , $\vec{B}$ =(8 , 0 , 0) , $\vec{C}$= (0 , 4 , 0) =…….cubic unit

(a) 8 (b) 16 (c) 32 (d) 64

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(12) Answer one of the following items:

a) Find the different forms of the equation of the straight line passing through the point (4 , -2 , 5) and the vector (1 , -2 , 2) is a direction vector of it.

b) If $\vec{C}$ = (2 , 1 , -2) and $\vec{C} + \vec{B} = \vec{C} \times \overrightarrow{B}$, then find $\| \overrightarrow{B} \|$

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(13) The diameter length of the sphere $x^2 + y^2 + z^2 - 6x + 4y - 2z = 11$ equals …….length unit

(a) 5 (b) 10 (c) 11 (d) 15

(14) Solve the following systems of equations using the inverse matrix:

$2x + z = 5\,, x + y = 3\,, z - y = 1$

(15)If the two straight lines $\frac{x+1}{3} = \frac{2-y}{3} = \frac{z-3}{6}$, $\frac{x}{2} = \frac{y+1}{-2} = \frac{z-1}{k}$ are parallel, then k =……

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

(16) If the straight line $\frac{x}{3} = y = \frac{z}{-3}$ is parallel to the plane $x + ky + 2z + k = 0$, then k =……

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

(17) If $Z_1 = 1 + \sqrt{3}\ i$, $Z_2 = \sqrt{2}\ (cos45^0 + i \sin 45^0)$, Find the exponential form of : $(z_1 \div z_2)^6$

(18) The length of the perpendicular drawn from the point (1 , -6, 3) to the plane

$\vec{r} \odot (2 , -2 , 1) = 5$

(19) Find the point of intersection of the straight line : $x = y = z$ and the plane:

$\vec{r} \odot (1 , 2 , 3) = 12$