ONE TWO ACADEMY

Unit Test - 03

TOTAL:- 45 **GENERAL MATHEMATICS** **STD XII**

Theory of Equations

Choose the correct answer:- ***5 x 1 = 5***

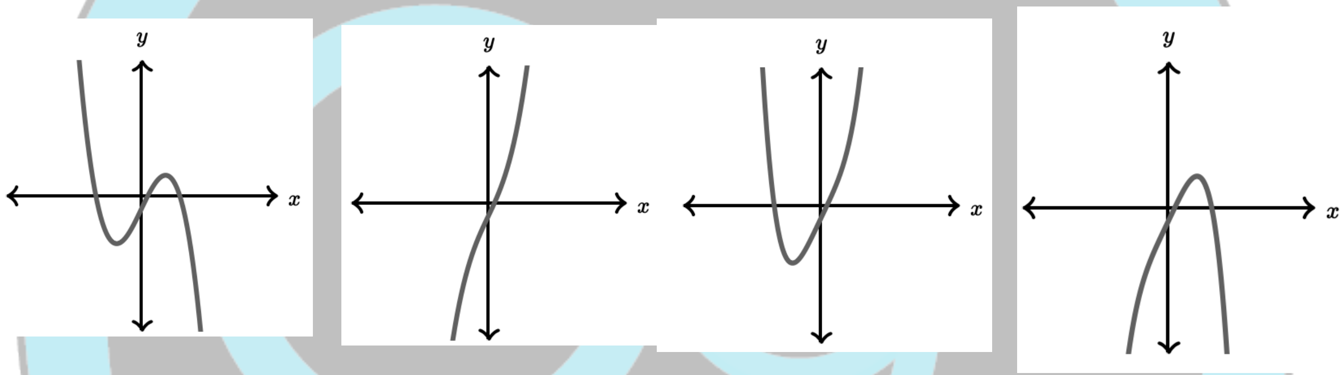
1)If $2 - \sqrt{3}$ is a root of the quadratic equation, $x^2 + px + q = 0$, then

(1)$q^2 - 4p - 16 = 0$ (2)$q^2 + 4p + 14 = 0$ (3)$p^2 - 4q - 12 = 0$ (4)$p^2 - 4q - 12 = 0$

2)If the equation $x^2 + 2x + 3 = 0$ and $ax^2 + bx + c = 0$, a,b,c belongs to **R** have a common root, then a:b:c is

(1)1:2:3 (2)3:2:1 (3)1:3:2 (4)3:1:2

3)Which of the following could be the graphs of $f(x) = -8x^3+7x-1$?



4)The number of real solutions of the equation $|x|^2 - 3|x| + 2 = 0$ is (1) 4 (2) 1 (3) 3 (4) 2

5)Let a>0, b>0 and c>0, Then both of the roots of the equation $ax^2 + bx + c = 0$.

(1) are real and negative (2) have negative real parts (3) have positive real parts (4)None

Answer any five of the following (Question no 13 is compulsory):- ***5 x 2 = 10***

6)State first fundamental theorem of Algebra.

7)Find a polynomial equation of minimum degree having $2 - \sqrt{3}$ as a root.

8) "A line cannot cut a circle only at one point" Give reason.

9)Show that the equation $2x^2 - 6x + 7 = 0$ cannot be satisfied by any real values of x.

10)Determine the number of positive and negative roots of the equation $x^9 - 5x^8 - 14x^7 = 0$.

11)" Any odd degree polynomial equation with real coefficients has always at least one real root" Justify.

12)If the sides of cube box are increased by 1, 2 and 3 units respectively to form a cuboid, the volume increased by 52 sq units. Find the volume of cuboid.

13)Solve:- $8x^3 - 2x^2 - 7x + 3 = 0$.

Answer any five of the following(Question no 20 is compulsory):- ***5 x 3 = 15***

14)Solve the equation $3x^3 - 16x^2 + 23x - 6 = 0$ if the product of two roots is 1.

15)If p and q are the roots of the equation $lx^2 + nx + n = 0$, show that

$$\sqrt{\frac{p}{q}} + \sqrt{\frac{q}{p}} + \sqrt{\frac{n}{l}} = 0$$

16)Find a polynomial equation of minimum degree with rational coefficients having $\sqrt{5} - \sqrt{3}$ as root.

17)Obtain the condition of the roots $x^3 + px^2 + qx + r = 0$ are in A.P.

18)Solve the cubic equation $2x^3 - x^2 - 18x + 9 = 0$ if sum of two of it's roots vanishes.

19)Show that if p,q,r are rational, the roots of the equation $x^2 - 2px + p^2 - q^2 + 2qr - r^2 = 0$ are rational.

20)Prove that a line cannot intersect a circle at more than two points.

21)Examine for rational roots $2x^3 - x^2 - 1 = 0$.

Answer the following:- ***3 x 5 = 15***

22)Prove that the sum of squares of the roots of $ax^4 + bx^3 + cx^2 + dx + e = 0$, $a \neq 0$ is $\frac{b^2 - 2ac}{a^2}$ and hence deduct the sum of squares of the roots of equation $2x^4 - 8x^3 + 6x^2 - 3 = 0$.

OR

Solve $8x^{\frac{3}{2n}} - 8x^{\frac{-3}{2n}} = 63$.

23)Determine k and solve the equation $2x^3 - 6x^2 + 3x + k = 0$ if one of the roots is twice the sum of the other two roots.

OR

Solve $(x-4)(x-7)(x-2)(x+1) = 16$.

24)Form the equation whose roots are the squares of the roots of the cubic equation $x^3 + ax^2 + bx + c = 0$.

OR

If the equations $x^2 + px + q = 0$ and $x^2 + p'x + q' = 0$ have a common root, show that it must be equal to $\frac{pq' - p'q}{q - q'}$ or $\frac{q - q'}{p' - p}$.

ALL THE BEST