Test Analysis (Mathematics)					
Student Name :			**Batch :**		
Type	**Marking Scheme**	**Right**	**Wrong**	**Left**	**Score**
Single Answer Correct (Q1-Q10)	**+4, -1**				
Multiple Answer Correct (Q11-Q18)	**+4, -1**				
Numerical Answer Type (Q19-Q25)	**+4, -1**				
Total					

Single Choice Correct Type

1. $x=\sqrt{2+\sqrt{2+\sqrt{2+.....\infty}}}$ then x =

(A) 2 and –1 (B) 2 and 1
(C) –1 (D) none of these

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

(A) 4 (B) 2
(C) 1 (D) 3

3. If the roots of the quadratic equation $x^2-ax+b=0$ are real and differ by a quantity less than 1, then

(A) $b>\frac{a^2}{4}$ (B) $b<\frac{a^2-1}{4}$
(C) $\frac{a^2-1}{4}<b<\frac{a^2}{4}$ (D) none of these

4. The set of values of 'a' for which the equation $x^3-3x+a=0$ has three distinct real roots, is

(A) (-∞, ∞) (B) (-2, 2)
(C) (-1, 1) (D) none of these

5. The least integral value of k such that $(k-2)x^2+8x+k+4$ is positive for all real values of x is

(A) 1 (B) 2
(C) 3 (D) 5

6. If α and β are the roots of the equation $x^2-P(x+1)-q=0$ then the value of $\frac{\alpha^2+2\alpha+1}{\alpha^2+2\alpha+q}+\frac{\beta^2+2\beta+1}{\beta^2+2\beta+q}$ is

(A) 2 (B) 1
(C) 0 (D) None

7. In the quadratic equation $ax^2 + bx + c = 0$, $\Delta = b^2 - 4ac$ and $\alpha + \beta$, $\alpha^2 + \beta^2$, $\alpha^3 + \beta^3$, are in G.P. where α, β are the root of $ax^2 + bx + c = 0$, then

(A) $\Delta \neq 0$ (B) $b\Delta = 0$
(C) $c\Delta = 0$ (D) $\Delta = 0$

8. The sum of real roots of the equation $x^2 - 2^{2008}x + |x - 2^{2007}| + 2(2^{4013} - 1) = 0$

(A) 2^{2007} (B) 2^{2006}
(C) 2^{2008} (D) None of these

9. If x_1 and x_2 are the roots of $x^2+(\sin\theta-1)x-\frac{1}{2}\cos^2\theta=0$ then the maximum value of $x_1^2+x_2^2=$

(A) 2 (B) 3

(C) $\frac{9}{4}$ (D) 4

10. If $f(x)=0$ is a cubic equation with positive and distinct roots α, β, γ such that β is the H.M of the roots of $f'(x)=0$. then α, β, γ are in

(A) A.P (B) G.P

(C) H.P (D) none of these

Multiple Choice Correct Type

11. If $a, b \in \{1, 2, 3, 4\}$ and $ax^2+bx+1=0$ has real roots, then

(A) $a>b$ (B) $a \le b$

(C) Number of possible pairs (a, b) is 7 (D) none of these

12. The values(s) which 'c' may take so that x^3-6x^2+9x-c is of the form $(x-\alpha)^2(x-\beta)$ $(\alpha, \beta$ real$)$ is/are

(A) 0 (B) 4

(C) 1 (D) 3

13. Let α,β be the roots of $x^2-4x+A=0$ and γ,δ be the roots of $x^2-36x+B=0$. If $\alpha,\beta,\gamma,\delta$ form an increasing G.P., then

(A) B = 81 A (B) A = 3

(C) B = 243 (D) A + B = 251

14. If the equation $cx^2+bx-2a=0$ has no real roots and $a<\frac{b+c}{2}$ then

(A) $ac<0$ (B) $a<0$

(C) $\frac{c-b}{2}>a$ (D) $\frac{c+2b}{8}>a$

15. If a, b and c are three terms of an A.P such that $a \ne b$ then $\frac{b-c}{a-b}$ may be equal to

(A) $\sqrt{2}$ (B) $\sqrt{3}$

(C) 1 (D) 3

16. Let a, b, c $\in$ R. If $ax^2 + bx + c = 0$ has two real roots A and B where, A < -1 and B > 1, Then

(A) $1+\left|\frac{b}{a}\right|+\frac{c}{a}<0$ (B) $1-\left|\frac{b}{a}\right|+\frac{c}{a}<0$

(C) $|c|<|a|$ (D) $|c|<|a|-|b|$

17. If α,β are roots of $ax^2+bx+c=0,\ ac\ne0$, then

(A) $\frac{1}{\alpha},\frac{1}{\beta}$ are the roots of $cx^2+bx+a=0$

(B) $-\alpha,-\beta$ are the roots of $ax^2-bx+c=0$

(C) α^2,β^2 are the roots of $a^2x^2-(b^2-2ac)x+c^2=0$

(D) $2\alpha,2\beta$ are the roots of $ax^2+2bx+4c=0$

18. If α is one root of the equation $4x^2 + 2x - 1 = 0$, then its other root is given by

(A) $4\alpha^3 - 3\alpha$ (B) $4\alpha^3 + 3\alpha$

(C) $\alpha - (1/2)$ (D) $-\alpha - (1/2)$

Numerical Answer Type

19. The number of real roots of $\left(7+4\sqrt{3}\right)^{|x|-8}+\left(7-4\sqrt{3}\right)^{|x|-8}=14$ is

20. The number of integral solutions of $\frac{x+2}{x^2+1}>\frac{1}{2}$ is3

21. The number of solutions of the equation $\left[2x\right]-\left[x+1\right]=2x$ must be equal to (where [.] denotes the greatest integer function)

22. Let $P(x) = x^3 - 8x^2 + cx - d$ be a polynomial with real coefficients and with all its roots being distinct positive integers. Then number of possible value of c is _____.

23. If $x^2+2ax+a<0 \ \forall \ x \in (1,2)$ then the minimum value of $|5a|$ is

24. If the roots of equation $ax^2+bx+c=0 \ (a\neq 0)$ are α and β and the roots of the equation $a^5x^2+ba^2c^2x+c^5=0$ are 4 & 8 then the numerical value of $\alpha\beta$ is

25. Let 'S' be the sum of all the integral values of 'a' for which one root of the equation $(a-5)x^2-2ax+a-4=0$ is smaller than 1 and the other is greater than 2, then $\frac{S-61}{25}$ is equal to