Techno ACE

Model Question Paper

Mathematics

Class: XI going to XII

Time: 22.5 mints **F.M. 15 × 4 = 60**

For every correct answer examinee will be awarded +4 marks and for every wrong answer it will be – 1 mark

1. Value of sin 15° is

(A) $\frac{\sqrt{3}-1}{2\sqrt{2}}$ (B) $\frac{\sqrt{3}+1}{2\sqrt{2}}$

(C) $2-\sqrt{3}$ (D) $2+\sqrt{3}$

2. The complete solution of $\frac{(x+2)(x+5)}{(x-3)} < 0$ is

(A) $(-\infty, -2) \cup (3, 5)$ (B) $(-5, -2) \cup (3, \infty)$

(C) $(-\infty, -5) \cup (2, 3)$ (D) $(-\infty, -5) \cup (-2, 3)$

3. If $n(A) = 10$, $n(B) = 15$ and $n(A \cap B) = 2$, then $n(A \cup B)$ is

(A) 23 (B) 25

(C) 27 (D) 21

4. The smallest value of $|z|^2 + |z-3|^2 + |z-6i|^2$ where $z \in C$ occurs for z equal to

(A) Zero (B) $1 + 2i$

(C) $1 + 3i$ (D) $1 + 6i$

5. Value of $\sin^2 5° + \sin^2 10° + \sin^2 15° + \ldots + \sin^2 85°$ is

(A) $\frac{19}{2}$ (B) 9

(C) 8 (D) $\frac{17}{2}$

6. Range of $f(x) = \text{sgn}(x^2 - 2x + 4)$ is

(A) {1} (B) {– 1, 0, 1}

(C) {0} (D) {– 1}

7. The value of $\frac{\sin 9^\circ.\sin 21^\circ.\sin 39^\circ.\sin 51^\circ.\sin 69^\circ.\sin 81^\circ}{\sin 54^\circ}$ is

(A) $\frac{1}{8}$ (B) $\frac{1}{16}$

(C) $\frac{1}{32}$ (D) $\frac{1}{64}$

PARAGRAPH FOR Q. 8 & Q.9

'Consider the letters of the word MEDITATION'.

8. The number of 10 lettered words that can be formed which starts and ends with 'T' is

(A) $\frac{8!}{2}$ (B) 8!

(C) $\frac{10!}{2!\,2!}$ (D) $\frac{10!}{8}$

9. The number of 10 lettered words that can be formed so that all the vowels are together is

(A) $\frac{(6!)(5!)}{2}$ (B) $\frac{(6!)(5!)}{4}$

(C) $\frac{6!}{2!}$ (D) (6!) (5!)

10. Domain of $f(x) = \frac{x}{\sqrt{x^2-1}}$ is

(A) $(-\infty, -1) \cup (1, \infty)$ (B) $(-1, 1)$

(C) $[-1, 1]$ (D) $[1, \infty)$

11. If $\prod_{k=1}^{22} \cos(4k^\circ) = 2^{-n}$, then the value of n is

(A) 11 (B) 22

(C) 44 (D) Zero

12. **A** : If $n(A) = 6$, $n(B) = 5$, $n(A \cap B) = 2$, then $n(A \cup B)$ is 9.

R : $n(A \cup B) = n(A) + n(B) - n(A \cap B)$.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

13. Sum of all the negative roots of the equation $(x + 2)(x + 3)(x + 8)(x + 12) - 4x^2 = 0$ is

(A) -13 (B) -10

(C) -25 (D) $-10 - \left(\frac{15+\sqrt{129}}{2}\right)$

14. The A. M. of a set of 50 numbers is 38. If two numbers of set, namely 55 and 45 are discarded, then A.M. of remaining set of numbers is

(A) 38.5 (B) 37.5

(C) 36.5 (D) 36

15. Let α and β be the zeros of $f(x) = ax^2 + bx + c$, $a \neq 0$ and $\Delta = b^2 - 4ac$. If $\alpha + \beta$, $\alpha^2 + \beta^2$ and $\alpha^3 + \beta^3$ are in G.P., then

(A) $\Delta \neq 0$ (B) *b*. $\Delta = 0$

(C) *c*. $\Delta = 0$ (D) $bc \neq 0$