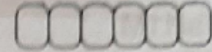


Tsl11M

Tenkasi District
Common First Mid Term Test - 2024



Standard 11
MATHEMATICS

Time: 1.30 Hrs.

Marks: 45

I. Choose the best:**10×1=10**

- 1) If $n[(A \times B) \cap (A \times C)] = 8$ and $n(B \cap C) = 2$ then $n(A) =$
 a) 6 b) 8 c) 16 d) 4
- 2) The range of the function $f(x) = \lfloor x \rfloor - x$, $x \in \mathbb{R}$ is
 a) $[0, 1]$ b) $[0, 1)$ c) $[0, \infty)$ d) $(0, 1)$
- 3) The number of constant functions from the set containing m elts to the set containing n elts is
 a) mn b) m c) n d) $m+n$
- 4) The solution of $5x-1 < 24$ and $5x+1 > -24$ is
 a) $(4, 5)$ b) $(-5, -4)$ c) $(-5, 5)$ d) $(-5, 4)$
- 5) If $\frac{Kx}{(x+2)(x-1)} = \frac{2}{x+2} + \frac{1}{x-1}$, then the value of K is
 a) 1 b) 2 c) 3 d) 4
- 6) The number of solutions of $x^2 + |x-1| = 1$ is
 a) 1 b) 0 c) 2 d) 3
- 7) $\cos 1^\circ + \cos 2^\circ + \cos 3^\circ + \dots + \frac{R.40^\circ}{2} \cos 179^\circ =$
 a) 0 b) -1 c) 1 d) 89
- 8) If $\tan \alpha$ and $\tan \beta$ are the roots of $x^2 + ax + b = 0$ then $\frac{\sin(\alpha + \beta)}{\sin \alpha \sin \beta}$ is equal to
 a) $\frac{b}{a}$ b) $\frac{a}{b}$ c) $-\frac{a}{b}$ d) $-\frac{b}{a}$
- 9) If $\sin \alpha + \cos \alpha = b$ then $\sin 2\alpha$ is equal to
 a) $b^2 - 1$, if $b \leq \sqrt{2}$ b) $b^2 - 1$, if $b > \sqrt{2}$
 c) $b^2 - 1$, if $b \geq 1$ d) $b^2 - 1$, if $b \geq \sqrt{2}$
- 10) 1 radian =
 a) $57^\circ 17' 45''$ b) $57^\circ 27' 45''$ c) $57^\circ 07' 45''$ d) $57^\circ 17' 35''$

II. Answer 3 questions. Q.No. 14 is compulsory:**3×2=6**

- 11) If $A = \{1, 2, 3, 4\}$ and $B = \{3, 4, 5, 6\}$ find $n[(A \cup B) \times (A \cap B) \times (A \Delta B)]$.

12) Evaluate: $\left[\left((256)^{-1/2} \right)^{-1/4} \right]^3$

- 13) Find the value of $\sin 18^\circ$.

14) P.T $\frac{\sin 4x + \sin 2x}{\cos 4x + \cos 2x} = \tan 3x$.

Tsi11M

2

III. Answer 3 questions. Q.No. 18 is compulsory:

3×3=9

- 15) If $\sin x = \frac{15}{17}$ and $\cos y = \frac{12}{13}$, $0 < x < \frac{\pi}{2}$, $0 < y < \frac{\pi}{2}$. Find the value of $\sin(x+y)$.
- 16) If $a^2 + b^2 = 7ab$, S.T $\log\left(\frac{a+b}{3}\right) = \frac{1}{2}(\log a + \log b)$.
- 17) If one root of $K(x-1)^2 = 5x-7$ is double the other root. S.T $K = 2$ or -25 .
- 18) Find the range of the function $f(x) = \frac{1}{1-3\cos x}$.

IV. Answer the following questions:

4×5=20

- 19) If $A+B+C = 180^\circ$, P.T $\sin 2A + \sin 2B + \sin 2C = 4 \sin A \sin B \sin C$.

(OR)

From the curve $y = x$ draw, (i) $y = -x$ (ii) $y = 2x$ (iii) $y = x+1$ (iv) $y = \frac{1}{2}x + 1$
(v) $2x+y+3 = 0$.

- 20) Find all values of x for which $\frac{x^3(x-1)}{(x-2)} > 0$.

(OR)

In a survey of 5000 people in a town, it was found that 45% of the people know language A, 25% know language B, 10% know language C, 5% know language A and B, 4% know language B and C and 4% know language C and A. If 3% of the people know all three languages. Find number of people knows only language A.

- 21) Resolve the rational expression into partial fractions: $\frac{x+12}{(x+1)^2(x-2)}$

(OR)

In $\triangle ABC$, P.T $\tan \frac{A-B}{2} = \frac{a-b}{a+b} \cot \frac{C}{2}$.

- 22) Solve: $\sin \theta + \cos \theta = \sqrt{2}$

(OR)

Solve:

- i) $\log_{5-x}(x^2 - 6x + 65) = 2$
ii) $\log_8 x + \log_4 x + \log_2 x = 11$