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FOR TS CLASS 11 PREPARATION

TS Inter 1st Year Model Paper 2027 Mathematics IA

EXAM	YEAR	TYPE	SUBJECT
TS Class 11	2027	Sample Paper	Maths

TELANGANA BOARD OF INTERMEDIATE EDUCATION

MATHEMATICS - IA

MODEL QUESTION PAPER w.e.f. 2026 - 27

Time : 3 Hours **Max. Marks : 60**

Note : The Question Paper consists of three sections A, B and C.

Section - A

10 × 2 = 20 Marks

I. Very Short Answer Questions

(i) Answer all questions

(ii) Each Question carries two marks

1. Find the power set of the set $A = \{-3, 0, 3\}$

2. Find the 10^{th} term of the arithmetic progression 3, 5, 7, 9, ...

3. If $f : R \to R$ and $f(x) = \frac{1-x^2}{1+x^2}$, then show that $f(\tan\theta) = \cos 2\theta$.

4. If $\begin{bmatrix} x-1 & 2 & 5-y \\ 0 & z-1 & 7 \\ 1 & 0 & a-5 \end{bmatrix} = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 4 & 7 \\ 1 & 0 & 0 \end{bmatrix}$, then find the values of x, y, z and a.

5. If $A = \begin{bmatrix} -1 & 2 & 3 \\ 2 & 5 & 6 \\ 3 & x & 7 \end{bmatrix}$ is a symmetric matrix, then find x.

6. If $\bar{a} = \bar{i} - 2\bar{j}$ then find a vector in the direction of $\bar{a}$ that has magnitude 7 units.

7. Find the period of $\text{Tan}(x + 4x + 9x + ... + n^2x)$.

8. Find the range of $7\cos x - 24\sin x + 5$.

9. If $\sinh x = 3$, then show that $x = \log_e(3+\sqrt{10})$.

10. If in triangle ABC, $a = 2$ cm, $b = 3$ cm, $c = 4$ cm, then find $\cos A$.

Section - B

6 × 4 = 24 Marks

II. Short Answer Questions

(i) Answer any Six Questions.

(ii) Each Question carries Four marks.

11. If $f = \{(1, a)\ (2, c), (4, d), (3, b)\}$ and $g^{-1} = \{(2, a)\ (4, b), (1, c), (3, d)\}$, then show that $(gof)^{-1} = f^{-1}og^{-1}$.

12. Prove that $2 + 7 + 12 + ... + (5n-3) = \dfrac{n(5n-1)}{2}\ \forall\ n \in \mathbf{N}$, using mathematical induction.

13. Show that $\begin{vmatrix} bc & b+c & 1 \\ ca & c+a & 1 \\ ab & a+b & 1 \end{vmatrix} = (a-b)\ (b-c)\ (c-a)$.

14. If $\bar{a}$, $\bar{b}$, $\bar{c}$ are three non-coplanar vectors, then verify the collinearity of the following points whose position vectors are given by $\bar{a} - 2\bar{b} + 3\bar{c}$, $2\bar{a} + 3\bar{b} - 4\bar{c}$, $-7\bar{b} + 10\bar{c}$.

15. If $\bar{a} = 2\bar{i} + 2\bar{j} - 3\bar{k}$, $\bar{b} = 3\bar{i} - \bar{j} + 2\bar{k}$, then find the angle between $2\bar{a} + \bar{b}$ and $\bar{a} + 2\bar{b}$.

16. Find the general solutions of the equation $2\sin^2\theta - 4 = 5\cos\theta$.

17. Find the value of $\sin\left(\text{Cos}^{-1}\dfrac{4}{5} + \text{Cos}^{-1}\dfrac{12}{13}\right)$.

18. In ΔABC, prove that $\left(\dfrac{1}{r} - \dfrac{1}{r_1}\right)\left(\dfrac{1}{r} - \dfrac{1}{r_2}\right)\left(\dfrac{1}{r} - \dfrac{1}{r_3}\right) = \dfrac{abc}{\Delta^3} = \dfrac{4R}{r^2 s^2}$.

Section - C

$2 \times 8 = 16$ Marks

III. Long Answer Questions

(i) Answer any Two questions.

(ii) Each Question carries eight marks.

19. Solve the following equations by matrix inversion method

$$2x - y + 3z = 8$$
$$-x + 2y + z = 4$$
$$3x + y - 4z = 0.$$

20. If $\bar{a} = \bar{i} - 2\bar{j} - 3\bar{k}$, $\bar{b} = 2\bar{i} + \bar{j} - \bar{k}$ and $\bar{c} = \bar{i} + 3\bar{j} - 2\bar{k}$, then verify that $\bar{a} \times (\bar{b} \times \bar{c}) \neq (\bar{a} \times \bar{b}) \times \bar{c}$.

21. If A, B, C are angles in a triangle, then prove that

Sin 2A – Sin 2B + Sin 2C = 4 cosA sin B cos C.