

MT

2017 ____ 1100

Seat No.

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MT - GEOMETRY - SEMI PRELIM - I : PAPER - 3

Time : 2 Hours

(Pages 3)

Max. Marks : 40

Note :

- (i) All questions are compulsory.
- (ii) Use of calculator is not allowed.

Q.1. Attempt ANY FIVE of the following :

5

- (i) Write the equation of the line if $m = -2$ and $c = 3$.
- (ii) If $\tan \alpha = \sqrt{3}$, then $\alpha = ?$
- (iii) Write the equation of a line parallel to Y-axis and passing through the point (3, 4).
- (iv) If $\theta + \alpha = 90^\circ$ and $\operatorname{cosec} \theta = \sqrt{2}$, then find the value of $\sec \alpha$?
- (v) Write the slope of the line stated below :
$$y + 3 = \frac{1}{2} (x - 5)$$
- (vi) If $\alpha + \beta = 90^\circ$ and $\tan \alpha = \frac{3}{4}$ then what is the value of $\cot \beta$?

Q.2. Solve ANY FOUR of the following :

8

- (i) Draw a tangent to a circle of a radius 3.1 cm and centre O at any point 'R' on the circle.
- (ii) Find the trigonometric ratios in standard position whose terminal arm passes through the point $(-1, \sqrt{3})$.

- (iii) Write the equation of the line passing through the points (3, 4) and having slope 5.
- (iv) Draw a circle of radius 3.6 cm, take a point M on it. Draw a tangent to the circle at M without using centre of the circle.
- (v) Prove : $\sec^2 \theta + \operatorname{cosec}^2 \theta = \sec^2 \theta \cdot \operatorname{cosec}^2 \theta$.
- (vi) Write the equation of the line passing through the pair of points (2, 3) and (4, 7) in the form $y = mx + c$.

Q.3. Solve ANY THREE of the following :**9**

- (i) Construct tangents to the circle from point B with radius 3.5 cm and centre A. Point B is at a distance 7.3 cm from the centre.
- (ii) If $\tan \theta = 1$, then find the value of $\frac{\sin \theta + \cos \theta}{\sec \theta + \operatorname{cosec} \theta}$, where θ is an acute angle.
- (iii) If (1, 2), $\left(\frac{1}{2}, 3\right)$ and (0, k) are collinear points find the value of k.
- (iv) If $3 \tan^2 \theta - 4\sqrt{3} \tan \theta + 3 = 0$, find the value of θ .
- (v) Show that the line joining (- 1, 1) and (- 9, 6) is parallel to the line joining (- 2, 14) and (6, 9).

Q.4. Solve ANY TWO of the following :**8**

- (i) Prove : $(1 + \tan \theta)^2 + (1 + \cot \theta)^2 = (\sec \theta + \operatorname{cosec} \theta)^2$.
- (ii) Construct incircle of ΔSGN such that $SG = 6.7$ cm, $\angle S = 70^\circ$, $\angle G = 50^\circ$ and draw incircle of ΔSGN .
- (iii) Show that : $\frac{\cos^2 \theta}{1 - \tan \theta} + \frac{\sin^3 \theta}{\sin \theta - \cos \theta} = 1 + \sin \theta \cdot \cos \theta$

Q.5. Solve ANY TWO of the following :

10

- (i) $\triangle AMT \sim \triangle AHE$, construct $\triangle AMT$, $MA = 6.3$ cm, $\angle MAT = 120^\circ$, $AT = 4.9$ cm
and $\frac{MA}{HA} = \frac{7}{5}$, construct $\triangle AHE$.
- (ii) The angle of elevation of a cloud from a point 60 m above a lake is 30° and the angle of depression of the reflection of cloud in the lake is 60° . Find the height of the cloud.
- (iii) A (5, 4), B (-3, -2) and C (1, -8) are the vertices of a triangle ABC. Find the equation of median AD and line parallel to AC passing through point B.

Best Of Luck 🍀