

MT

2017 ____ 1100

Seat No.

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MT - GEOMETRY - SEMI PRELIM - I : PAPER - 5

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 :

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- (i) Write the equation of the line if $m = 0$ and $c = 2$.
- (ii) If $\sec \theta = 2$, what is the value of $\tan^2 \theta$?
- (iii) If the slope of a line is 2 and its y-intercept is 5, write its equation.
- (iv) If $3 \sin \theta - 4 \cos \theta = 0$, what is the value of $\tan \theta$?
- (v) Write the slope of the line stated below :
 $3(x + 3) = y - 1$
- (vi) If $\theta = -30^\circ$, find the value of $\sin \theta$.

Q.2. Solve ANY FOUR of the following :

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- (i) Draw a tangent at any point 'M' on the circle of radius 2.9 cm and centre 'O'.
- (ii) Find the trigonometric ratios in standard position whose terminal arm passes through the point (1, - 1).
- (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) If $\tan A + \frac{1}{\tan A} = 2$ then show that $\tan^2 A + \frac{1}{\tan^2 A} = 2$.
- (vi) Write the equation of the line passing through the pair of points $(-3, 5)$ and $(4, -7)$ in the form $y = mx + c$.

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

- (i) Draw tangents to the circle with centre P and radius 2.9 cm. From a point Q which is at a distance 8.8 cm from the centre.
- (ii) If $\sqrt{3} \tan \theta = 3 \sin \theta$ then find the value of $\sin^2 \theta - \cos^2 \theta$, where $\theta \neq 0$.
- (iii) The points $(k, 3)$, $(2, -4)$ and $(-k + 1, -2)$ are collinear, find k.
- (iv) Prove : $\frac{\tan \theta}{\sec \theta + 1} + \frac{\sec \theta + 1}{\tan \theta} = 2 \operatorname{cosec} \theta$.
- (v) Find x if the slope of line joining $(x, -2)$ and $(8, -11)$ is $\frac{-3}{4}$.

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

- (i) If $\sec \theta + \tan \theta = p$ then show that $\frac{p^2 - 1}{p^2 + 1} = \sin \theta$.
- (ii) Construct the incircle of ΔSTU in which, $ST = 7$ cm, $\angle T = 120^\circ$, $TU = 5$ cm.
- (iii) Show that : $\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \frac{1}{\sec \theta - \tan \theta}$

Q.5. Solve ANY TWO of the following :

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(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) Find the equation of the line passing through the point of intersection of $4x + 3y + 2 = 0$ and $6x + 5y + 6 = 0$ and the point of intersection of lines $4x - 3y - 17 = 0$ and $2x + 3y + 5 = 0$.

Best Of Luck 🍀