

MT

2017 ____ 1100

Seat No.

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MT - GEOMETRY - SEMI PRELIM - I : PAPER - 2

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 $m = -4$ and $c = -3$.
- (ii) What is the value of $(1 + \tan^2 \theta) (1 - \sin \theta) (1 + \sin \theta)$?
- (iii) Write the equation of a line parallel to X-axis and passing through the point $(-2, 5)$.
- (iv) If $\tan \theta = \sqrt{15}$, what is the value $\sec \theta$?
- (v) Write the slope of the line stated below :
 $y - 2 = 5(x - 2)$
- (vi) If $\theta = -30^\circ$, find the value of $\sin \theta$.

Q.2. Solve ANY FOUR of the following :

8

- (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 $(-24, -7)$.
- (iii) Write the equation of the line passing through the points $(2, 3)$ and $(4, 5)$.

- (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 points (3, 4) and having slope 5.

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

- (i) Construct $\triangle LEM$ such that, $LE = 6\text{cm}$, $LM = 7.5\text{ cm}$, $\angle LEM = 90^\circ$ and draw its circumcircle.
- (ii) $3 \sin \alpha - 4 \cos \alpha = 0$, then find the values of $\tan \alpha$, $\sec \alpha$ and $\operatorname{cosec} \alpha$, where α is an acute angle.
- (iii) Show that the line joining $(-1, 1)$ and $(-9, 6)$ is parallel to the line joining $(-2, 14)$ and $(6, 9)$.
- (iv) If $\sec \theta + \tan \theta = p$ then show that $\frac{p^2 - 1}{p^2 + 1} = \sin \theta$.
- (v) If $(1, 2)$, $\left(\frac{1}{2}, 3\right)$ and $(0, k)$ are collinear points find the value of k .

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

- (i) Prove : $\frac{\tan \theta}{\sec \theta + 1} + \frac{\sec \theta + 1}{\tan \theta} = 2 \operatorname{cosec} \theta$.
- (ii) Construct the incircle of $\triangle DEF$ in which $DE = DF = 5.8\text{ cm}$, $\angle EDF = 65^\circ$.
- (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 :

10

- (i) $\triangle SHR \sim \triangle SVU$, construct $\triangle SHR$, $SH = 4.5$ cm, $HR = 5.2$ cm, $SR = 5.8$ cm
and $\frac{SH}{SV} = \frac{3}{5}$; construct $\triangle SVU$.
- (ii) A tree 12m high, is broken by the wind in such a way that its top touches the ground and makes an angle 60° with the ground. At what height from the bottom, the tree is broken by the wind ?
($\sqrt{3} = 1.73$)
- (iii) If P (- 2, 4), Q (4, 8), R (10, 5) and S (4, 1) are the vertices of a quadrilateral then show that it is a parallelogram.

Best Of Luck 🍀