

Model Question Paper**Trigonometry - Part II**

10th Standard

MathsReg.No. :

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I. Answer all the questions.

II. Use blue pen only.

Time : 01:00:00 Hrs

Total Marks : 40

5 x 1 = 5

Part-A

- 1) $\cos^4 x - \sin^4 x =$
(a) $2\sin^2 x - 1$ (b) $2\cos^2 x - 1$ (c) $1 + 2\sin^2 x$ (d) $1 - 2\cos^2 x$
- 2) If $\tan \theta = \frac{a}{x}$, then the value of $\frac{x}{\sqrt{a^2 + x^2}} =$
(a) $\cos \theta$ (b) $\sin \theta$ (c) $\operatorname{cosec} \theta$ (d) $\sec \theta$
- 3) If $x = a \sec \theta$, $y = b \tan \theta$, then the value of $\frac{x^2}{a^2} - \frac{y^2}{b^2} =$
(a) 1 (b) -1 (c) $\tan^2 \theta$ (d) $\operatorname{cosec}^2 \theta$
- 4) $\frac{\sec \theta}{\cot \theta + \tan \theta} =$
(a) $\cot \theta$ (b) $\tan \theta$ (c) $\sin \theta$ (d) $-\cot \theta$
- 5) $\frac{\sin(90^\circ - \theta) \sin \theta}{\tan \theta} + \frac{\cos(90^\circ - \theta) \cos \theta}{\cot \theta} =$
(a) $\tan \theta$ (b) 1 (c) -1 (d) $\sin \theta$

Part-B

5 x 2 = 10

- 6) Determine whether each of the following is an identity or not $\cos^2 \theta + \sec^2 \theta = 2 + \sin \theta$
- 7) Prove the following identities $\sec^2 \theta + \operatorname{cosec}^2 \theta = \sec^2 \theta \operatorname{cosec}^2 \theta$
- 8) A kite is flying with a string of length 200 m. If the thread makes an angle 30° with the ground, find the distance of the kite from the ground level. (Here, assume that the string is along a straight line)
- 9) A ladder leaning against a vertical wall, makes an angle of 60° with the ground. The foot of the ladder is 3.5 m away from the wall. Find the length of the ladder.
- 10) Find the angular elevation (angle of elevation from the ground level) of the Sun when the length of the shadow of a 30 m long pole is $10\sqrt{3}$ m.

Part-C

5 x 5 = 25

- 11) If $\tan \theta + \sin \theta = m$, $\tan \theta - \sin \theta = n$ and $m \neq n$ then show that $m^2 - n^2 = 4\sqrt{mn}$
- 12) If $\tan^2 \alpha = \cos^2 \beta - \sin^2 \beta$ then prove that $\cos^2 \alpha - \sin^2 \alpha = \tan^2 \beta$
- 13) Prove the following identities. $\frac{\sin(90^\circ - \theta)}{1 + \sin \theta} + \frac{\cos \theta}{1 - \cos(90^\circ - \theta)} = 2 \sec \theta$
- 14) If $x = a \sec \theta + b \tan \theta$ and $y = a \tan \theta + b \sec \theta$, then prove that $x^2 - y^2 = a^2 - b^2$
- 15) If $\tan \theta = n \tan \alpha$ and $\sin \theta = m \sin \alpha$ then prove that $\cos^2 \theta = \frac{m^2 - 1}{n^2 - 1}$, $n \neq \pm 1$
