

4. Write short answers to any Nine parts.

- What is the length of the arc intercepted on a circle of radius 14 cms by the arms of a central angle of 45° ?
- Verify $\tan 2\theta = \frac{2 \tan \theta}{1 - \tan^2 \theta}$, When $\theta = 45^\circ$.
- Prove the identity: $\frac{1 - \sin \theta}{\cos \theta} = \frac{\cos \theta}{1 + \sin \theta}$.
- Without using calculator, find the value of $\cot (-855^\circ)$.
- Show that $\cos(\alpha + \beta) \cos(\alpha - \beta) = \cos^2 \beta - \sin^2 \alpha$.
- Prove the identity: $1 + \tan \alpha \tan 2\alpha = \sec 2\alpha$
- Prove that period of $\sin x$ is 2π
- When the angle between the ground and the sun is 30° , flag pole casts a shadow of 40 m long. Find the height of the top of the flag.
- Find the area of the triangle ABC, given three sides $a = 18$, $b = 24$, $c = 30$.
- Show that $r_1 = s \tan \frac{\alpha}{2}$
- Show that $\cos(\sin^{-1} x) = \sqrt{1 - x^2}$.
- Solve the equation; $\sin x = \frac{1}{2}$.
- Define trigonometric equation.

SECTION - C

(Each question carries 10 marks)

- Prove that $\begin{vmatrix} b & -1 & a \\ a & b & 0 \\ 1 & a & b \end{vmatrix} = a^3 + b^3$ 5
 - Solve the equation $4^x - 3 \cdot 2^{x+3} + 128 = 0$ 5
 - Resolve into partial fraction $\frac{1}{(x-1)^2(x+1)}$ 5
 - Show that the sum of n A.Ms. between "a" and "b" is equal to n times their A.M. 5
 - Show that ${}^{16}C_{11} + {}^{16}C_{10} = {}^{17}C_{11}$ 5
 - If $y = \frac{1}{3} + \frac{1.3}{2!} \left(\frac{1}{3} \right)^2 + \frac{1.3.5}{3!} \left(\frac{1}{3} \right)^3 + \dots$, then prove that $y^2 + 2y - 2 = 0$ 5
 - Prove that $\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \tan \theta + \sec \theta$ 5
 - Show that $\cos 20^\circ \cos 40^\circ \cos 80^\circ = \frac{1}{8}$ 5
 - Prove that $\sin^{-1} \frac{4}{5} + \sin^{-1} \frac{5}{13} + \sin^{-1} \frac{16}{25} = \frac{\pi}{2}$ 5
 - The area of triangle is 2437. if $a = 79$, $c = 97$, then find angle β . 5

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CANCELLED