

## Comprehensive Test Series-07 Trigonometric Function

TIME: 1hr

MM:

### General Instructions:

- All Questions are compulsory.
  - Marks are given along with the questions individually.
  - Use of calculator is not permitted.
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- Q.1 The minute hand of a watch is 1.5 cm long. How far does its tip move in 40 minutes?  
(use  $\pi = 3.14$ ).
- Q.2 Find the radian measures corresponding to the following degree measures:  
(i)  $-47^{\circ}30'$  (ii)  $520^{\circ}$
- Q.3 Find the degree measures corresponding to the following radian measures  $-4$  (Use  $\pi = \frac{22}{7}$ ).
- Q.4 A wheel makes 360 revolutions in one minute. Through how many radians does it turn in one second?
- Q.5 In a circle of diameter 40 cm, the length of a chord is 20cm. Find the length of minor arc of the chord
- Q.6 If in two circles, arcs of the same length subtend angles  $60^{\circ}$  and  $75^{\circ}$  at the centre, find the ratio of their radii.
- Q.7 If  $\cot x = -\frac{5}{12}$ ,  $x$  lies in second quadrant, find the values of the other five trigonometric functions.
- Q.8 Find the value of  $\sin \frac{31\pi}{3}$ .
- Q.9 Find the value of the trigonometric functions.  
(i)  $\operatorname{cosec}(-1410^{\circ})$  (ii)  $\cot(-\frac{15\pi}{4})$
- Q.10 Find the value of trigonometric functions.  
 $\tan x = -\frac{5}{12}$ ,  $x$  lies in second quadrant.

Prove the following

Q.11  $\cot^2 \frac{\pi}{6} + \operatorname{cosec} \frac{5\pi}{6} + 3 \tan^2 \frac{\pi}{6} = 6$

$$\text{Q.12 } \frac{\tan\left(\frac{\pi}{4} + x\right)}{\tan\left(\frac{\pi}{4} - x\right)} = \left(\frac{1 + \tan x}{1 - \tan x}\right)^2$$

$$\text{Q.13 } \frac{\cos(\pi + x)\cos(-x)}{\sin(\pi - x)\cos\left(\frac{\pi}{2} + x\right)} = \cot^2 x$$

$$\text{Q.14 } \cos\left(\frac{3\pi}{2} + x\right)\cos(2\pi + x)\left[\cot\left(\frac{3\pi}{2} - x\right) + \cot(2\pi + x)\right] = 1$$

$$\text{Q.15 } \sin 2x + \sin 4x + \sin 6x = 4\cos^2 x \sin 4x$$

$$\text{Q.16 } \cot 4x (\sin 5x + \sin 3x) = \cot x (\sin 5x - \sin 3x)$$

$$\text{Q.17 } \frac{\sin x - \sin 3x}{\sin^2 x - \cos^2 x} = 2 \sin x$$

$$\text{Q.18 } \tan 4x = \frac{4 \tan x(1 - \tan^2 x)}{1 - 6 \tan^2 x + \tan^4 x}$$

$$\text{Q.19 } \cos 6x = 32 \cos^6 x - 48 \cos^4 x + 18 \cos^2 x - 1$$

$$\text{Q.20 } \frac{\sin(x + y)}{\sin(x - y)} = \frac{\tan x + \tan y}{\tan x - \tan y}$$

$$\text{Q.21 } \frac{\sin 5x - 2 \sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$$

$$\text{Q.22 } \cos^2 2x - \cos^2 6x = \sin 4x \cdot \sin 8x$$

$$\text{Q.23 } \frac{\sin x - \sin 3x}{\sin^2 x - \cos^2 x} = 2 \sin x$$

$$\text{Q.24 } \cos 4x = 1 - 8 \sin^2 x \cdot \cos^2 x$$

$$\text{Q.25 } \frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$$

$$\text{Q.26 } 2 \cos \frac{\pi}{13} \cos \frac{9\pi}{13} + \cos \frac{3\pi}{13} + \cos \frac{5\pi}{13} = 0$$

$$\text{Q.28 } \sin 3x + \sin 2x - \sin x = 4 \sin x \cos \frac{x}{2} \cos \frac{3x}{2}$$