



Estd 1864

# FORMAN CHRISTIAN COLLEGE, LAHORE

## LAHORE BOARD MCQs, SHORT & LONG QUESTIONS

### CHAPTER # 9

#### Q.1 Multiple Choice Questions

i)  $\pi$  radians

- a)  $360^\circ$                       b)  $360'$                       c)  $180^\circ$                       d)  $45^\circ$

ii)  $\frac{\pi}{2}$  radian is an angle

- a) Acute                      b) Obtuse                      c) Straight                      d) Quadrantal

iii) The vertex of an angle in standard form is at

- a) (1,0)                      b) (0,1)                      c) (1,1)                      d) (0,0)

iv) If  $\cot\theta > 0$  and  $\sin\theta < 0$ , then terminal arc of angle lies in quadrant.

- a) I                      b) II                      c) III                      d) IV

v)  $\theta^\circ$  is measured in

- a) Circular System    b) Sexagesimal System    c) MKS System    d) CGS System

vi)  $1 + \cot^2\theta =$

- a)  $\sec^2\theta$                       b)  $\frac{1}{\sin^2\theta}$                       c)  $\tan^2\theta$                       d)  $\frac{1}{\sec^2\theta}$

vii) If  $\sin\theta = \frac{\sqrt{3}}{2}$  then  $\theta$  is

- (a)  $60^\circ$                       b)  $30^\circ$                       c)  $90^\circ$                       d) none of these

viii)  $105^\circ =$

- (a)  $\frac{7\pi}{12}$                       (b)  $\frac{2\pi}{3}$                       (c)  $\frac{5\pi}{12}$                       (d)  $\frac{5\pi}{6}$

ix)  $\sec\theta \csc\theta \sin\theta \cos\theta =$

- (a) 1                      (b) 0                      (c)  $\sin\theta$                       (d)  $\cos\theta$

x)  $\cot 45^\circ =$

- (a) 1                      (b)  $\sqrt{3}$                       (c)  $\frac{1}{\sqrt{3}}$                       (d) 1

xi)  $\cot^2 \theta - \csc^2 \theta =$

(a) 0

(b) 1

(c) -1

(d) 2

xii) Value of  $\sin 60^\circ$  is

(a)  $\frac{2}{\sqrt{3}}$

(b)  $\frac{\sqrt{3}}{2}$

(c)  $2\sqrt{3}$

(d) None of these

xiii) Which one is true?

a) 1radian  $< 1^\circ$

b) 1radian  $> 1^\circ$

c) 1radian  $= 1^\circ$

d) 5radian  $= 2^\circ$

**Answer key:** i) a  
vii) a  
xiii) b

ii) d  
viii) a

iii) d  
ix) a

iv) c  
x) a

v) b  
xi) c

vi) b  
xii) b

## SHORT QUESTIONS

Q.1 Define Radian

Q.2 Prove that  $\sin(180 + \theta) = -\sin \theta$

Q.3 Convert  $\frac{2\pi}{3}$  radian into degree

Q.4 Prove that  $\sec\theta \operatorname{cosec}\theta \sin\theta \cos\theta = 1$

Q.5 Show that  $2\sin 45^\circ + \frac{1}{2} \operatorname{csc} 45^\circ = \frac{3}{\sqrt{2}}$

Q.6 Find  $r$  when  $l=56\text{cm}$  and  $\theta = 45^\circ$

Q.7 If  $\cot\theta = \frac{15}{8}$  and the terminal arm of the angle is not in first quadrant,

find the value  $\cos\theta$  and  $\operatorname{cosec}\theta$ .

Q.8 Verify that  $\sin^2 \frac{\pi}{6} + \sin^2 \frac{\pi}{3} + \tan^2 \frac{\pi}{4} = 2$

Q.9 If  $\tan \theta = -\frac{1}{3}$  and the terminal arm of the angle is in quad II find remaining trigonometric functions.

Q.10 Find the radius of the circle in which the arms of central angle of measure 1 radian cut off an arc of length 35cm.

Q.11 Verify when  $\theta = 30^\circ, 45^\circ$

a)  $\cos 2\theta = 2\cos^2 \theta - 1$       b)  $\sin 2\theta = 2 \sin \theta \cos \theta$

Q.12  $\cot^2 \theta - \cos^2 \theta = \cos^2 \theta \cot^2 \theta$

Q.13 Verify  $\cos 2\theta = \cos^2 \theta - \sin^2 \theta$  when  $\theta = 30^\circ, 45^\circ$

Q.14 Prove that  $1 + \tan^2 \theta = \sec^2 \theta$ .

Q.15 Prove that  $1 + \cot^2 \theta = \operatorname{cosec}^2 \theta$

Q.16 Show that  $\frac{\sin\theta}{1+\cos\theta} + \cot\theta = \operatorname{cosec}\theta$

Q.17 Derive the fundamental identity  $\sin^2 \theta + \cos^2 \theta = 1$

Q.18 Prove that  $\frac{1+\cos\theta}{1-\cos\theta} = (\operatorname{cosec}\theta + \cot\theta)^2$

Q.19 Find  $\cot\theta = \frac{15}{8}$  and the terminal arm of the angle is not in quad I, find the values of remaining trigonometric function

Q.20 Prove that  $\sin^3\theta + \cos^3\theta = (\sin\theta + \cos\theta)(1 - \sin\theta\cos\theta)$

Q.21 Find the values of the remaining trigonometric functions:

If  $\tan\theta = \frac{-1}{\sqrt{2}}$  and the terminal arm of the angle is not in quad III.

Q.22 Prove that  $\cos^2\theta - \sin^2\theta = \frac{1-\tan^2\theta}{1+\tan^2\theta}$

## LONG QUESTIONS

Q.1: If  $\operatorname{cosec}\theta = \frac{m^2+1}{2m}$   $m > 0$ ,  $0 < \theta < \frac{\pi}{2}$  find the value of the remaining trigonometric function.

Q.2: If  $\cot\theta = \frac{5}{2}$  and terminal arm of the angle is in I quad find the value

$$\frac{3 \sin \theta + 4 \cos \theta}{\cos \theta - \sin \theta}$$

Q.3: Prove that  $\sin^2 \theta + \cos^2 \theta = 1 - 3 \sin^2 \theta \cos^2 \theta$

Q.4: Prove that  $\frac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta + 1} = \tan\theta + \sec\theta$

Q.5: Prove the identity  $\frac{1}{\operatorname{cosec}\theta - \cot\theta} - \frac{1}{\sin\theta} = \frac{1}{\sin\theta} - \frac{1}{\operatorname{cosec}\theta + \cot\theta}$

Q.6 Prove that  $\sin^6\theta - \cos^6\theta = (\sin^2\theta - \cos^2\theta)(1 - \sin^2\theta\cos^2\theta)$

Q.7 If  $\tan\theta = \frac{1}{\sqrt{7}}$  and the terminal arm of the angle is not in the III quadrant,

find the value of  $\frac{\csc^2\theta - \sec^2\theta}{\csc^2\theta + \sec^2\theta} = \frac{3}{4}$ .

Q.8 Prove that  $(\tan\theta + \cot\theta)^2 = \sec^2\theta \operatorname{csc}^2\theta$

Q.9 Prove that  $\frac{1 - \sin\theta}{\cos\theta} = \frac{\cos\theta}{1 + \sin\theta}$

Q.10 Find the value of the other five trigonometric functions of  $\theta$ , if  $\cos\theta = \frac{12}{13}$

and the terminal side of the angle is not in the I quadrant.