CONCEPT ACADEMY

"UTSAAH" Test Series

"Intelligence plus character-that is the goal of true education."
-Martin Luther King Jr.

Subject –Maths XI I IIT-JEE I NDA I CUET

Topic Covered:-
Chapter 3:- Trigonometric Functions

1. The value of $\cos^2 x + \cos^2 y - 2\cos x \times \cos y \times \cos(x + y)$ is
   (a) $\sin(x + y)$
   (b) $\sin^2(x + y)$
   (c) $\sin^3(x + y)$
   (d) $\sin^4(x + y)$

2. If the radius of the circumcircle of an isosceles triangle PQR is equal to PQ (= PR), then the angle P is
   (a) $2\pi/3$
   (b) $\pi/3$
   (c) $\pi/2$
   (d) $\pi/6$

3. The value of $(\sin 7x + \sin 5x)/(\cos 7x + \cos 5x) + (\sin 9x + \sin 3x)/(\cos 9x + \cos 3x)$ is
   (a) $\tan 6x$
   (b) $2\tan 6x$
   (c) $3\tan 6x$
   (d) $4\tan 6x$

4. If $\tan A - \tan B = x$ and $\cot B - \cot A = y$, then the value of $\cot(A - B)$ is
   (a) $x + y$
   (b) $1/x + y$
   (c) $x + 1/y$
   (d) $1/x + 1/y$

5. The value of $4 \times \sin x \times \sin(x + \pi/3) \times \sin(x + 2\pi/3)$ is
   (a) $\sin x$
   (b) $\sin 2x$
   (c) $\sin 3x$
   (d) $\sin 4x$

6. If $\cos a + 2\cos b + \cos c = 2$ then a, b, c are in
   (a) $2b = a + c$
   (b) $b^2 = a \times c$
   (c) $a = b = c$
   (d) None of these

7. The value of $\cos 20 + 2\sin^2 55 - \sqrt{2}\sin 65$ is
   (a) 0
   (b) 1
   (c) -1
   (d) None of these

8. The general solution of $\sqrt{3}\cos x - \sin x = 1$ is
   (a) $x = n \times \pi + (-1)n \times (\pi/6)$
   (b) $x = \pi/3 - n \times \pi + (-1)n \times (\pi/6)$
   (c) $x = \pi/3 + n \times \pi + (-1)n \times (\pi/6)$
   (d) $x = \pi/3 - n \times \pi + (\pi/6)$

9. If $\tan^2 \theta = 1 - e^2$, then the value of $\sec \theta + \tan^3 \theta \times \csc \theta$ is
   (a) $2 - e^2$
   (b) $(2 - e^2)^{1/2}$
   (c) $(2 - e^2)^2$
   (d) $(2 - e^2)^{3/2}$

10. The value of $\cos 5\pi$ is
    (a) 0
    (b) 1
    (c) -1
    (d) None of these

11. In a triangle ABC, $\csc A (\sin B \cos C + \cos B \sin C)$ equals
    (a) none of these
    (b) c/a
    (c) 1
    (d) a/c

12. If $3 \times \tan(x - 15) = \tan(x + 15)$, then the value of x is
    (a) 30
    (b) 45
    (c) 60
    (d) 90

13. If the sides of a triangle are 13, 7, 8 the greatest angle of the triangle is

(a) π/3

(b) π/2

(c) 2π/3

(d) 3π/2

14. If the angles of a triangle be in the ratio 1 : 4 : 5, then the ratio of the greatest side to the smallest side is

   (a) 4 : (√5 − 1)

   (b) 5 : 4

   (c) (√5 − 1) : 4

   (d) none of these

15. The value of tan 20 × tan 40 × tan 80 is

   (a) tan 30

   (b) tan 60

   (c) 2 tan 30

   (d) 2 tan 60

16. If the angles of a triangle be in the ratio 1 : 4 : 5, then the ratio of the greatest side to the smallest side is

   (a) 4 : (√5 − 1)

   (b) 5 : 4

   (c) (√5 − 1) : 4

   (d) none of these

17. The perimeter of a triangle ABC is 6 times the arithmetic mean of the sines of its angles. If the side b is 2, then the angle B is

   (a) 30°

   (b) 90°

   (c) 60°

   (d) 120°

18. The value of cos 180° is

   (a) 0

   (b) 1

   (c) -1

   (d) infinite

19. If cos a + 2cos b + cos c = 2 then a, b, c are in

   (a) 2b = a + c

   (b) $b^2 = a \times c$

   (c) a = b = c

   (d) None of these

20. If a×cos x + b × cos x = c, then the value of (a × sin x − b^2cos x)² is

   (a) $a^2 + b^2 + c^2$

   (b) $a^2 - b^2 - c^2$

   (c) $a^2 - b^2 + c^2$

   (d) $a^2 + b^2 - c^2$