Mock - Test - 5

B.Sc. CS I T.

(1) If $\sec\alpha$ and $\operatorname{cosec}\alpha$ are the roots of $x^2 - px + q = 0$ then

(a) $p^2 + q^2 = 1$ (b) $p^2 = q(q+2)$ ✓ (c) $p^2 - q^2 = 2$ (d) $p + q = -1$

(2) The minimum value of $x^2 + 8x + 17$ is

(a) 1 ✓ (b) -1 (c) 0 (d) 17

(3) If a, b, c are in G.P, a, x, b are in A.P and b, y, c are in A.P then $\frac{1}{x} + \frac{1}{y} =$

(a) $2b$ (b) $\frac{2}{b}$ ✓ (c) $a + c$ (d) $2b - a$

(4) $A\,(\text{adj}\,A)$ is equal to

(a) I (b) 0 (c) $|A|I$ ✓ (d) $|A^n|I$

(5) If $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ then $A^n =$

(a) ✓ $\begin{bmatrix} 1 & 2n \\ 0 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & n \\ 0 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 2n & 1 \\ 0 & -1 \end{bmatrix}$

(d) $\begin{bmatrix} n & 2n \\ 0 & n \end{bmatrix}$

(6) The system of equations $kx + 3y = 0$, $x + 2y = 0$ has no solution for $k =$

(a) $\frac{2}{3}$ (b) $\frac{3}{2}$ ✓ (c) -1 (d) 0

(7) $\left|5-\frac{2}{x}\right|<1$ is equivalent to

(a) $-1 \leq x \leq \frac{1}{2}$ (b) $\frac{1}{3}<x<\frac{1}{2}$ (c) $-\frac{5}{2}<x<\frac{3}{2}$

(d) $-1<x<\frac{3}{2}$

(8) Domain of $y=f(x)=\frac{1}{\sqrt{x-1}}$ is

(a) $(-\infty,1)$ (b) $(0,\infty)$ (c) $(1,\infty)$ (d) $(0,1)$

(9) The value of $(1-\omega+\omega^2)^4(1+\omega-\omega^2)^4 =$

(a) 128 (b) 256 (c) 512 (d) 64

(10) A line passes through the point $(2,2)$ and is perpendicular to line $3x+y=3$. Then, its y-intercept is:

(a) $\frac{1}{3}$ (b) $\frac{2}{3}$ (c) 1 (d) $\frac{4}{3}$

(11) If the lines $x+2ay+a=0$, $x+3by+b=0$ and $x+4cy+c=0$ are concurrent then a, b, c are in

(a) A.P (b) G.P (c) H.P (d) none

(12) If the sum of the slopes of the liner $x^2+kxy-3y^2=0$ is twice the product of the slopes then $k=$

(a) -2 (b) 1 (c) 2 (d) 0

(13) The equation of the normal to the circle $x^2+y^2-4x+4y-17=0$ that passes through $(1,1)$ is

(a) $3x+y-4=0$ (b) $2x-4y+1=0$ (c) $x+3y=0$ (d) $7x-4y+2=0$

14. The equation $x^2+y^2+4x+ky+13=0$ represents a point circle if $k=$

(a) 4 (b) 6 (c) 2 (d) 3

15. In ΔABC, $\frac{c-a\cos B}{b-a\cos C} =$

(a) $\frac{\cos B}{\cos C}$ (b) $\frac{\cos A}{\cos B}$ (c) $\frac{\sin B}{\sin C}$ (d) $\frac{\sin A}{\sin B}$

16. The function $\sin^{-1}x + \cos^{-1}x$ is

(a) one-one function (b) identity function (c) even function (d) constant function

17. General solution of $2\sin^2 x + \sqrt{3}\cos x + 1 = 0$

(a) $2n\pi + \frac{\pi}{6}$ (b) $n\pi + \frac{5\pi}{6}$ (c) $n\pi + \frac{\pi}{6}$ (d) $2n\pi + \frac{5\pi}{6}$

18. $\lim_{x \to \frac{\pi}{2}} (\sec x)^{\cot x} =$

(a) -1 (b) 0 (c) $\cot x \log(\cos x)$ (d) 1

19. Which one of the function is not a continuous function?

(a) Point function (b) constant function (c) Identity function (d) Modulus function

20. $\frac{d}{dx}\left(\sec^{-1}\frac{1}{\sqrt{1-x^2}}\right) =$

(a) $\frac{1}{x^2+1}$ (b) $\frac{1}{\sqrt{1-x^2}}$ (c) $\frac{-1}{\sqrt{1-x^2}}$ (d) $\frac{1-x^2}{1+x^2}$

21. $\int \frac{dx}{x+\sqrt{x}} =$

(a) $\ln(\sqrt{x}+1)$ (b) $2\ln(1-\sqrt{x})$ (c) $2\ln(\sqrt{x}+1)$ ✓
(d) $2\ln(\sqrt{x}-1)$

22. $\int_0^{\pi/2} \frac{dx}{1+\sin x} =$

(a) 0 (b) 1 ✓ (c) 2 (d) ∞

23. If $y = x + e^x$ then $\frac{d^2x}{dy^2} =$

(a) $\frac{1}{(e^x+1)^2}$ (b) $\frac{-e^x}{(1+e^x)^2}$ (c) ✓ $\frac{-e^x}{(e^x+1)^3}$ (d) e^x

24. The function $f(x) = 18x^2 - 8x^3 + x^4 - 24$ has the graph concave downward for

(a) $x > 3$ (b) $x < 1$ (c) ✓ $1 < x < 3$ (d) $x < 3$

25. The area bounded by curve $y^2 = 8x$ & $x^2 = 8y$ is

(a) $\frac{16}{3}$ (b) ✓ $\frac{64}{3}$ (c) $\frac{32}{5}$ (d) $\frac{8}{3}$