Examrace

Mathematics Objective Questions Paper 20

Q-1. $2\cos^{-1}x = \cos^{-1}\left(2x^2 - 1\right)$ holds true for all

(a) $|x| \leqslant 1$

(b) $0 \leqslant x \leqslant 1$

(c) $|x| < \frac{1}{2}$

(d) none of these

Q-2. $(\cos A + \cos B)(\cos 2A + \cos 2B)$ is equal to

(a) $\frac{\cos 4a + \cos 4B}{2(\cos A - \cos B)}$

(b) $\frac{\cos 4A \pm \cos 4B}{2(\cos A - \cos B)}$

(c) $\frac{\cos 4A \pm \cos 4B}{4(\cos A - \cos B)}$

(d) None of these

Q-3. if f (x) = log $\left(\frac{1+x}{1-x}\right)$, then $f\left(\frac{2x}{1+x}\right)$ is equal to

(a) f (x)

(b) 2 f (x)

(c) 4 f (x)

(d) none of these

Q-4. if $f(x) = \frac{|x|}{x}; x \neq 0$; then $\left|f(x) - f\left(-x\right)\right|$ is equal

(a) 0

(b) 2

(c) 1

(d) none of these

Q-5. If $80 = \pi$, then $\cos 70 + \cos\theta$ is equal

(a) 0

(b) 2

(c) 1

(d) none of these

Q-6. Which of the following is true?

(a) Domain of $\sin^{-1} x$ is $\left[-\frac{\pi}{2} . \frac{\pi}{2}\right]$

(b) Range of $\cos\ \sin\left(\sin - 1x + \cos^{-1} x\right)$ is $\{1\}$

(c) Range of $\cos\left(\sin^{-1} x + \cos^{-1} x\right)$ is $[-1,1]$

(d) Range of $\cos^{1} x$ is $\left[0, \frac{\pi}{2}\right]$

Q-7. Which of the following function is inverse to itself?

(a) $f(x) = \frac{1-x}{1+x}$

(b) $f(x) = 3^{\log\ x}$

(c) $f(x) = \frac{1-x^2}{1+x^2}$

(d) $f(x) = 2^{2(x-1)}$

Q-8. The value of $\sec^2\left(\tan^{1} 2\right) + \cos ec^2\left(\cos^{-1} 3\right)$ is equal to

(a) 5

(b) 15

(c) 13

(d) none of these

Q-9. Solution of the equation $\cos^{1}\left(\sqrt{3}x\right) + \cos^{-1} x = \frac{\pi}{2}$ is given by

(a) $\pm\frac{1}{2}$

(b) $-\frac{1}{2}$

(c) $\frac{1}{2}$

(d) none of these

Q-10. If $f(x) = \frac{x}{x-1} = \frac{1}{y}$, then $f(y) =$

(a) x

(b) x-1

(c) 1-x

(d) 1 + x

Q-11. If $\sin\alpha + \sin\beta + \sin\gamma = 3$, then value of $\cos\alpha + \cos\beta + \cos\gamma =$

(a) 0

(b) 1

(c) 2

(d) 3

Q-12. $\tan\left(2\sin^{-1}\left(\frac{4}{5}\right)\right)$ is equal to

(a) $\frac{7}{24}$

(b) $\frac{-7}{24}$

(c) $-\frac{24}{7}$

(d) $\frac{24}{7}$

13. $\text{Lim}_{x\to o}\left(\frac{\sin x - x}{x}\right)\cos\left(\frac{1}{x}\right)$ is equal to

(a) 0

(b) 1

(c) $\frac{1}{2}$

(d) none of these

14. if $f(x) = \begin{cases} \frac{\sin[x]}{[x]}, & [x] \neq 0, \\ 0, & [x] = 0 \end{cases}$ then $\lim_{x\to o} f(x)$

(a) is equal to 1

(b) is equal to 0

(c) is equal to -1

(d) does not exist

15. $\int e^{e^{e^{e}}} e^{o\,x} e^{x}$ is equal to

(a) $\frac{1}{2} G^{2\,e\,o^{x}}$

(b) $e^{o\,e\,x}$

(c) $\left(e^{o\,e\,x}\right)$

(d) $\frac{1}{2} \theta^{e\,o\,x}$

16. if f (x) =| x-1| , then

(a) $f\left(x^{2}\right) = (f(x))^{2}$

(b) $f(x+y) = f(x) + f(y)$

(c) $f(|x|) = |f(x)|$

(d) $f(x)$ is not derivable at $a = 1$

17. $\lim_{n\to\infty}$

$$\frac{\sum_{n-1}^{n} r}{n^{2}}$$

Is equal to

(a) $\frac{1}{2}$

(b) $\frac{1}{3}$

(c) $\frac{1}{4}$

(d) none of these

18. The value of $\int_{1}^{2} \frac{1}{x^{2}} e^{-1/x^{2}}$ dx is

(a) $\frac{1}{\sqrt{e}} + \frac{1}{e}$

(b) $\frac{1}{e} - \frac{1}{\sqrt{e}}$

(c) $\frac{1}{\sqrt{e}} - \frac{1}{e}$

(d) 0

19. $\int \frac{x+1}{(x+2)^2} e^x$ dx is equal to

(a) $\frac{-e^2}{(x+2)^2}$

(b) $\frac{e^2}{x+2}$

(d) None of these

20. $\lim_{x \to o} \frac{1}{2}$

(a) Is equal to 0

(b) Tends to ∞

(c) Tends to $-\infty$

(d) Does not exit

21. $\lim_{x \to o}$ x [x] is equal to

(a) 0 or 1

(b) 0 or -1

(c) 0

(d) none of these

22. $\int$ sin x sin $2x$ dx is equal to

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

(b) $\frac{1}{3}$

(c) $\frac{\pi}{3}$

(d) none of these

23. $\int_{\pi/12}^{\pi/2} \frac{1}{\cos 2x}$ dx =

(a) log 3

(b) $\frac{1}{2}$

(c) $\frac{1}{3}\log 2$

(d) none of these

24. If f (x) be any function which assumes only positive values and f (x) exists, then f ′ (x) is equal to

(a) $f(x)\frac{d}{\text{dx}}\left(e1\left(x\right)\right)$

(b) $f(x)\frac{d}{\text{dx}}\{\log(f(x))\}$

(c) $f\left(x\right)\frac{d}{\text{dx}}\left\{e^{\log}\right\}$

(d) none of these

Q-25. $\lim_{x \to o} \frac{(1+x)^n - 1)}{x}$ is equal to

(a) 1

(b) n

(c) n-1

(d) none of these

Q-26. $\int \log x$ dx is equal to

(a) $\frac{1}{2}(\log x)^2$

(b) $\frac{1}{x}$

(c) $x \log x - x$

(d) none of these

Q-27. $\hat{i}.\left(2\hat{j}\times 3\hat{k}\right)+\hat{j}.\left(2\hat{k}\times \hat{3}j\right)+\hat{k}.\left(2\hat{i}\times \hat{3}\right)$ is

(a) 18

(b) 0

(c) -18

(d) none of these

Q-28. If the vectors $2\hat{j} + 3\hat{j} - 4\hat{k}$ and $a\hat{j} + \hat{j} - b\hat{j} + c\hat{k}$ are at right angles, then a, b, c can have values

(a) a = 2, b = 3, c =-4

(b) a = 4, b = 4, c = 5

(c) a = 4, b = 4, c =-5

(d) a = 4, b =-4, c =-5

Q-29. C_1 and C_2 are the centers of the two circle whose radius are r_1 and r_2. The two circle touch each other internally if

(a) $|C_1C_2| = r_1 + r_2$

(b) $|C_1C_2| = |r_1 - r_2|$

(c) $|C_1C_2| = r_1 - r_2$

(d) $|C_1C_2| = r_2 - r_1$

Q-30. The length of perpendicular from the origin upload the line $\frac{x}{y} + \frac{y}{b} = 1$ is

(a) $\frac{\text{ab}}{\sqrt{a^2 + b^2}}$

(b) $\frac{-\text{ab}}{\sqrt{a^2 + b^2}}$

(c) $\frac{|\text{ab}|}{\sqrt{a^2} + b^2}$

(d) none of these

Q-31. If cross product of two non-zero vectors is zero, then the vectors are

(a) Collinear

(b) Co-directional

(c) Co-initial

(d) Co-terminus

Q-32. The number of vectors of unit length perpendicular to vectors of unit length perpendicular to vectors $\hat{u} = \hat{i} + \hat{j}$ and $\hat{v} = \hat{j} + \hat{k}$, is

(a) one

(b) three

(c) two

(d) infinite

Q-33. The line passing through (0,1) and perpendicular to the line x-2y + 11 = 0 is

(a) $2x - y + 1 = 0$

(b) $2x - y + 3 = 0$

(c) $2x + y - 1 = 0$

(d) $2x + y - 2 = 0$

Q-34. The perpendicular distance of the origin from the line 3x + 4y + 1 = 0 is

(a) -1

(b) 1

(c) $-\frac{1}{5}$

(d) $\frac{1}{5}$

Q-35. If θ is the angle between two unit vectors $\overline{a}$ and $\overline{b}$, then $\cos\theta$ is equal to

(a) $\overline{a} + \overline{b}$

(b) $\overline{a} - \overline{b}$

(c) $\overline{a}.\overline{b}$

(d) $|\overline{a} \times \overline{b}|$

Q-36. If $\overline{a}, \overline{b}, \overline{c}$ are three vectors, then $[\overline{a}, \overline{b}, \overline{c}]$ is not equal to

(a) $[\overline{a}, \overline{c}, \overline{b}]$

(b) $[\overline{c}, \overline{a}, \overline{b}]$

(c) $-[\overline{a}, \overline{c}, \overline{b}]$

(d) none of these

Q-37. The acute angle between the lines x-y = 0 and y = 0 is

(a) 30^o

(b) 45^o

(c) 60^o

(d) 75^o

Q-38. The vertices of a triangle are (0.3) , (-3,0) and (3,0) . The orthocenter of the triangle is

(a) (0,0)

(b) (0,3)

(c) (3,0)

(d) (-3,0)

Q-39. The equation $\left(\hat{r} - \left(\hat{i} + \hat{j}\right)\right) . \left(\hat{r} - \left(\hat{j} + \hat{k}\right)\right) = 0$ represents

(a) pair of unites

(b) a pair of planes

(c) a spheres

(d) none of these

Q-40. The spheres
$x^2 + y^2 + z^2 + x + y + z - 1 = 0$ and $x^2 + y^2 + z^3 + x + y + z - 5 = 0$

(a) Intersect in a plane

(b) Intersect in five points

(c) Do not intersect

(d) None of these

Q-41. If a line passes through (2,2) and is perpendicular to the line 3x + y = 3, its y-intercept is

(a) -4

(b) $\frac{4}{3}$

(c) $-\frac{4}{3}$

(d) none of these

Q-42. The lines $x + (k - 1)\, y + 1 = 0$ and $2x + k^2 y - 1 = 0$ are at right angles if

(a) $k = 1$

(b) $k > 1$

(c) $k = -1$

(d) $|k| = 0$

Q-43. The distance of the point (x, y, z) from the x y – plane is

(a) x

(b) y

(c) z

(d) | z|

Q-44. The line $\frac{x-1}{1} = \frac{y-1}{2} = \frac{z-3}{1}$ and $\frac{z-2}{0} = \frac{y-3}{0} = \frac{z-3}{0}$ are

(a) Parallel

(b) Coincident

(c) Skew

(d) Perpendicular

Q-45. The G. M of the numbers $3, 3^2, 3^3 \ldots 3^n$ is

(a) $3^{2/n}$

(b) $3^{(n-1)2}$

(c) $3^{\frac{n}{2}}$

(d) $3^{(n+1)/2}$

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