KCET Test–2025 **PYQ**

Maths

1. If $A=\{x:x$ is an integer and $x^2-9=0\}$ $B=\{x:x$ is a natural number and $2\le x<5\}$ $C=\{x:x$ is a prime number $\le 4\}$ Then $(B-C)\cup A$ is,

(A) $\{-3,3,4\}$ (B) $\{2,3,4\}$

(C) $\{3,4,5\}$ (D) $\{2,3,5\}$ d

2. A and B are two sets having 3 and 6 elements respectively.

Consider the following statements.

Statement (I): Minimum number of elements in AUB is 3

Statement (II): Maximum number of elements in AB is 3

Which of the following is correct?

(A) Statement (I) is true, statement (II) is false
(B) Statement (1) is false, statement (II) is true
(C) Both statements (1) and (II) are true
(D) Both statements (I) and (II) are false

3. Domain of the function f, given by $f(x)=\frac{1}{\sqrt{(x-2)(x-5)}}$ is

(A) $(-\infty,2]\cup[5,\infty)$

(B) $(-\infty,2)\cup(5,\infty)$

(C) $(-\infty,3)\cup[5,\infty)$

(D) $(-\infty,3]\cup(5,\infty)$

4. If $f(x)=\sin[\pi^2]x-\sin[-\pi^2]x$, where $[x]=$ greatest integer $\le x$, then which of the following is not true?

(A) $f(0)=0$

(B) $f\left(\frac{\pi}{2}\right)=1$

(C) $f\left(\frac{\pi}{4}\right)=1+\frac{1}{\sqrt{2}}$

(D) $f(\pi)=-1$

5. Which of the following is not correct?

(A) $\cos 5\pi=\cos 4\pi$

(B) $\sin 2\pi=\sin(-2\pi)$

(C) $\sin 4\pi=\sin 6\pi$

(D) $\tan 45^\circ=\tan(-315^\circ)$

6. If $\cos x+\cos^2 x=1$, then the value of $\sin^2 x+\sin^4 x$ is

(A) -1
(B) 1
(C) 0
(D) 2

7. The mean deviation about the mean for the date $4,7,8,9,10,12,13,17$ is

(A) 10
(B) 3
(C)8.5
(D) 4.03

8. A random experiment has five outcomes w_1,w_2,w_3,w_4 and w_5. The probabilities of the occurrence of the outcomes w_1,w_2,w_3,w_4 and w_5 are respectively $\frac{1}{6},a,b$ and $\frac{1}{12}$ such that $12a+12b-1=0$. Then the probabilities of occurrence of the outcome w_3 is

(A) $\frac{2}{3}$ (B) $\frac{1}{3}$

(C) $\frac{1}{6}$ (D) $\frac{1}{12}$

9. A die has two face each with number ' 1 ', three faces each with number ' 2 ' and one face with number ' 3 '. If the die is rolled once, then P(1 or 3) is

(A) $\frac{2}{3}$ (B) $\frac{1}{2}$

(C) $\frac{1}{3}$ (D) $\frac{1}{6}$

10. Let $A=\{a,b,c\}$, then the number of equivalence relations on A containing (b,c) is

(A) 1 (B) 3
(C) 2 (D) 4

11. Let the functions " f " and " g " be $f:\left[0,\frac{\pi}{2}\right]\to R$ given by $f(x)=\sin x$ and $g:\left[0,\frac{\pi}{2}\right]\to R$ given by $g(x)=\cos x$, where R is the set of real numbers

Consider the following statements:

Statement (I): f and g are one-one

Statement (II): $f+g$ is one-one

Which of the following is correct?

(A) Statement (I) is true, statement (II) is false
(B) Statement (I) is false, statement (II) is true
(C) Both statements (I) and (I) are true
(D) Both statements (I) and (II) are false

12. $\sec^2\left(\tan^{-1}2\right)+\operatorname{cosec}^2\left(\cot^{-1}3\right)=$

(A) 1 (B) 5
(C) 15 (D) 10

13. $2\cos^{-1}x=\sin^{-1}\left(2x\sqrt{1-x^2}\right)$ is valid for all values of ' x ' satisfying

(A) $0\le x\le\frac{1}{\sqrt{2}}$
(B) $-1\le x\le 1$
(C) $0\le x\le 1$
(D) $\frac{1}{\sqrt{2}}\le x\le 1$

14. Consider the following statements:

Statement (I): In a LPP, the objective function is always linear.

Statement (II): Ina LPP, the linear inequalities on variables are called constraints.

Which of the following is correct?

(A) Statement (I) is true, Statement (II) is true
(B) Statement (I) is true, Statement (II) is false
(C) Both Statements (I) and (II) are false
(D) Statement (I) is false, Statement (II) is true

15. The maximum value of $z=3x+4y$, subject to the constraints $x+y\le 40, x+2y\le 60$ and $x,y\ge 0$ is

(A) 130 (B) 120
(C) 140 (D) 40

16. Consider the following statements.

Statement (I): If E and F are two independent events, then E′ and F′ are also independent.

Statement (II): Two mutually exclusive events with non-zero probabilities of occurrence cannot be independent.

Which of the following is correct?

(A) Statement (I) is true and statement (II) is false
(B) Statement (I) is false and statement (II) is true
(C) Both the statements are true
(D) Both the statements are false

17. If A and B are two non-mutually exclusive events such that $P(A|B)=P(B|A)$, then

(A) $A\subset B$ but $A\ne B$ (B) $A=B$
(C) $A\cap B=\phi$ (D) $P(A)=P(B)$

18. If A and B are two events such that $A\subset B$ and $P(B)\ne 0$, then which of the following is correct?

(A) $P(A|B)=\frac{P(B)}{P(A)}$ (B) $P(A|B)<P(A)$
(C) $P(A|B)\ge P(A)$ (D) $P(A)=P(B)$

19. Meera visits only one of the two temples A and B in her locality. Probability that she visits temple A is $\frac{2}{5}$. If she visits temple A, $\frac{1}{3}$ is the probability that she meets her friend, whereas it is $\frac{2}{7}$ if she visits temple B. Meera met her friend at one of the two temples. The probability that she met her at temple B is

(A) $\frac{7}{16}$
(B) $\frac{5}{16}$
(C) $\frac{3}{16}$
(D) $\frac{9}{16}$

20. If Z_1 and Z_2 are two non-zero complex numbers, then which of the following is not true?

(A) $\overline{Z_1+Z_2}=\overline{Z_1}+\overline{Z_2}$

(B) $|Z_1Z_2|=|Z_1|\cdot|Z_2|$

(C) $\overline{Z_1Z_2}=\overline{Z}_1\cdot\overline{Z}_2$

(D) $|Z_1+Z_2|\geq|Z_1|+|Z_2|$

21. Consider the following statements:

Statement(I) : The set of all solutions of the linear inequalities $3x+8<17$ and $2x+8\geq12$ are $x<3$ and $x\geq2$ respectively.

Statement (II): The common set of solutions of linear inequalities $3x+8<17$ and $2x+8\geq12$ is (2, 3)

Which of the following is true?

(A) Statement (I) is true but statement (II) is false

(B) Statement (I) is false but statement (II) is true

(C) Both the statements are true

(D) Both the statements are false

22. The number of four digit even number that can be formed using the digits 0,1,2 and 3 without repetition is

(A) 6

(B) 10

(C) 4

(D) 12

23. The number of diagonals that can be drawn in an octagon is

(A) 15

(B) 20

(C) 28

(D) 30

24. If the number of terms in the binomial expansion of $(2x+3)^{3n}$ is 22, then the value of n is

(A) 8

(B) 6

(C) 7

(D) 9

25. If 4^{th},10^{th} and 16^{th} terms of a G.P. are x, y and z respectively, then

(A) $z=\sqrt{xy}$

(B) $y=\sqrt{xz}$

(C) $x=\sqrt{yz}$

(D) $y=\dfrac{x+z}{2}$

26. If A is a square matrix such that $A^2=A$, then $(I-A)^3$ is

(A) $I-A$

(B) $A-I$

(C) $I+A$

(D) $-I-A$

27. If A and B are two matrices such that AB is an identity matrix and the order of matrix B is 3×4, then the order of matrix A is

(1) 3×4

(2) 3×3

(3) 4×3

(4) 4×4

28. Which of the following statements is not correct?

(1) A row matrix has only one row

(2) A diagonal matrix has all diagonal elements equal to zero

(3) A symmetric matrix A is a square matrix satisfying $A'=A$.

(4) A skew symmetric matrix has all diagonal elements equal to zero

29. If a matrix $A=\begin{bmatrix}1 & 1\\ 1 & 1\end{bmatrix}$ satisfies $A^6=k\,A'$, then the value of k is

(1) 32

(2) 1

(3) $\dfrac{1}{32}$

(4) 6

30. If $A=\begin{bmatrix} k & 2 \\ 2 & k \end{bmatrix}$ and $\left|A^3\right|=125$, then the value of k is

(A) ± 2
(B) ± 3
(C) -5
(D) -4

31. If A is a square matrix satisfying the equation $\mathrm{A}^2-5\,\mathrm{A}+7\mathrm{I}=0$, where I is the I dentity matrix and 0 is null matrix of same order, then $\mathrm{A}^{-1}=$

(A) $\frac{1}{7}(5I-A)$
(B) $\frac{1}{7}(A-5I)$
(C) $7(5\mathrm{I}-\mathrm{A})$
(D) $\frac{1}{5}(7\mathrm{I}-\mathrm{A})$

32. If A is a square matrix of order 3×3, $\det \mathrm{A}=3$, then the value of $\det\left(3\,\mathrm{A}^{-1}\right)$ is

(A) $\frac{1}{3}$
(B) 3
(C) 27
(D) 9

33. If $B=\begin{bmatrix} 1 & 3 \\ 1 & \alpha \end{bmatrix}$ be the adjoint of a matrix A and $|A|=2$, then the value of α is

(A) 4
(B) 5
(C) 2
(D) 3

34. The system of equations $4x+6y=5$ and $8x+12y=10$ has

(A) No solution
(B) Infinitely many solutions
(C) A unique solution
(D) Only two solutions

35. If $\vec{a}=\hat{i}+2\hat{j}+\hat{k}, \vec{b}=\hat{i}-\hat{j}+4\hat{k}$ and $\vec{c}=\hat{i}+\hat{j}+\hat{k}$ are such that $\vec{a}+\lambda\vec{b}$ is perpendicular to $\vec{c}$, then the value of λ is

(A) 1
(B) ± 1
(C) -1
(D) 0

36. If $|\vec{a}|=10, |\vec{b}|=2$ and $\vec{a}\cdot\vec{b}=12$, then the value of $|\vec{a}\times\vec{b}|$ is

(A) 5
(B) 10
(C) 14
(D) 16

37. Consider the following statements :

Statement (I) : If either $|\vec{\mathrm{a}}|=0$ or $|\vec{\mathrm{b}}|=0$, then $\vec{\mathrm{a}}\cdot\vec{\mathrm{b}}=0$

Statement (II) : If $\vec{a}\times\vec{b}=\vec{0}$, then a is perpendicular to b.

Which of the following is correct?

(A) Statement (I) is false but Statement (II) is false
(B) Statement (I) is false but Statement (II) is true
(C) Both Statement (I) and Statement (II) is true
(D) Both Statement (I) and Statement (II) is false

38. If a line makes angles $90^\circ, 60^\circ$ and θ with x, y and z axes respectively, where θ is acute, then the value of θ is

(A) $\frac{\pi}{6}$
(B) $\frac{\pi}{4}$
(C) $\frac{\pi}{3}$
(D) $\frac{\pi}{2}$

39. The equation of the line through the point $(0,1,2)$ and perpendicular to the line $\frac{x-1}{2}=\frac{y+1}{3}=\frac{z-1}{-2}$ is

(A) $\frac{x}{3}=\frac{y-1}{4}=\frac{z-2}{-3}$

Column – I		Column - II	
(a)	$x\|x\|$	(i)	continuous in (-1, 1)
(b)	$\sqrt{\|x\|}$	(ii)	differentiable in (-1, 1)
(c)	$x+[x]$	(iii)	strictly increasing in (-1, 1)
(d)	$\|x-1\|+\|x+1\|$	(iv)	not differentiable at, at least one point in (-1, 1)

(B) $\frac{x}{-3}=\frac{y-1}{4}=\frac{z-2}{3}$

(C) $\frac{x}{3}=\frac{y-1}{4}=\frac{z-2}{3}$

(D) $\frac{x}{3}=\frac{y-1}{-4}=\frac{z-2}{3}$

40. A line passes through $(-1,-3)$ and perpendicular to $x+6y=5$. Its x intercept is

(A) $\frac{1}{2}$ (B) $-\frac{1}{2}$

(C) -2 (D) 2

41. The length of the latus rectum of $x^2+3y^2=12$ is

(A) $\frac{2}{3}$ units (B) $\frac{1}{3}$ units

(C) $\frac{4}{\sqrt{3}}$ units (D) 24 units

42. $\lim\limits_{x\to 1}\frac{x^4-\sqrt{x}}{\sqrt{x}-1}$ is

(A) 0

(B) 7

(C) Does not exist

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

43. If $y=\frac{\cos x}{1+\sin x}$, then

(a) $\frac{dy}{dx}=\frac{-1}{1+\sin x}$

(b) $\frac{dy}{dx}=\frac{1}{1+\sin x}$

(c) $\frac{dy}{dx}=-\frac{1}{2}\sec^2\left(\frac{\pi}{4}-\frac{x}{2}\right)$

(d) $\frac{dy}{dx}=\frac{1}{2}\sec^2\left(\frac{\pi}{4}-\frac{x}{2}\right)$

(A) Only b is correct

(B) Only a is correct

(C) Both a and c are correct

(D) Both b and d are correct

44. Match the following:

In the following, $[x]$ denotes the greatest integer less than or equal to x.

(A) a - i, b - ii, c - iv, d - iii

(B) a-iv, b-iii, c-i, d-ii

(C) a-ii, b-iv, c-iii, d-i

(D) a - iii, b - ii, c - iv, d - i

45. The function $f(x)=\begin{cases} e^x+ax & ,x<0 \\ b(x-1)^2 & ,x\geq 0 \end{cases}$ is differentiable at $x=0$. Then

(A) $a=1,b=1$

(B) $a=3,b=1$

(C) $a=-3,b=1$

(D) $a=3,b=-1$

46. A function $f(x)=\begin{cases} \frac{e^{\frac{1}{x}}-1}{e^{\frac{1}{x}}+1}, & \text{if } x\neq 0 \\ 0, & \text{if } x=0 \end{cases}$ is

(A) continuous at $x=0$

(B) not continuous at $x=0$

(C) differentiable at $x=0$

(D) differentiable at $x=0$, but not continuous at $x=0$

47. If $y = a\sin^3 t, x = a\cos^3 t$, then $\frac{dy}{dx}$ at $t = \frac{3\pi}{4}$ is

(A) -1

(B) $\frac{1}{\sqrt{3}}$

(C) $-\sqrt{3}$

(D) 1

48. The derivative of sinx with respect to logx is

(A) cos$x$

(B) $x$cos$x$

(C) $\frac{\cos x}{\log x}$

(D) $\frac{\cos x}{x}$

49. The minimum value of $1-\sin x$ is

(A) 0 (B) -1

(C) 1 (D) 2

50. The function $f(x) = \tan x - x$

(A) always increases

(B) always decreases

(C) never increases

(D) neither increases nor decreases

51. The value of $\int \frac{dx}{(x+1)(x+2)}$ is

(A) $\log\left|\frac{x-1}{x+2}\right| + c$

(B) $\log\left|\frac{x-1}{x-2}\right| + c$

(C) $\log\left|\frac{x+2}{x+1}\right| + c$

(D) $\log\left|\frac{x+1}{x+2}\right| + c$

52. The value of $\int_{-1}^{1} \sin^5 x\cos^4 x dx$ is

(1) $-\pi/2$

(2) π

(3) $\pi/2$

(4) 0

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(1) $-\pi/2$

(2) π

(3) $\pi/2$

(4) 0

54. $\int \frac{dx}{x^2(x^4+1)^{3/4}}$ equals

(A) $\left(\frac{x^4+1}{x^4}\right)^{\frac{1}{4}} + c$ (B) $(x^4+1)^{\frac{1}{4}} + c$

(C) $-(x^4+1)^{\frac{1}{4}} + c$ (D) $-\left(\frac{x^4+1}{x^4}\right)^{\frac{1}{4}} + c$

55. $\int_0^1 \log\left(\frac{1}{x} - 1\right) dx$ is

(A) 1 (B) 0

(C) $\log_e 2$ (D) $\log_e\left(\frac{1}{2}\right)$

56. The area bounded by the curve $y = \sin\left(\frac{x}{3}\right)$, x axis, the lines $x = 0$ and $x = 3\pi$ is

(A) 9 sq. units

(B) $\frac{1}{3}$ sq. units

(C) 6 sq. units

(D) 3 sq. units

57. The area of the region bounded by the curve $y = x^2$ and the line $y = 16$ is

(A) $\frac{32}{3}$ sq. units (B) $\frac{256}{3}$ sq. units

(C) $\frac{64}{3}$ sq. units (D) $\frac{128}{3}$ sq. units

58. General solution of the differential equation $\frac{dy}{dx} + y\tan x = \sec x$ is

(A) $y\sec x = \tan x + c$

(B) $y\tan x = \sec x + c$

(C) $\operatorname{cosec} x = y\tan x + c$

(D) $x\sec x = \tan y + c$

59. If 'a' and 'b' are the order and degree respectively of the differentiable equation. $\left(\frac{d^2y}{dx^2}\right)^2+\left(\frac{dy}{dx}\right)^3+x^4=0$, then $a-b=$ ____

(1) 1 (2) 2

(3) -1 (4) 0

60. The distance of the point $P(-3,4,5)$ from yz plane is

(A) 4 units

(B) 5 units

(C) -3 units

(D) 3 units