KCET 2026 April 24 Mathematics

Question Paper

Conducted by KEA

General Instructions

- **Duration:** The total duration of the examination is 80 minutes.
- **Total Marks:** The complete paper carries a maximum of 60 marks.
- **Compulsory Questions:** All 60 questions are compulsory.
- Each question has four options. Only **one** option is correct.
- **Correct Answer:** +1 marks.
- **Incorrect Answer:** There is no Negative marking for incorrect answers.

1. $\tan^{-1}\left(\frac{1}{1+1\cdot2}\right)+\tan^{-1}\left(\frac{1}{1+2\cdot3}\right)+\cdots+\tan^{-1}\left(\frac{1}{1+n\cdot(n+1)}\right)=$

(A) $\tan^{-1}\left(\frac{n}{n+2}\right)$
(B) $\tan^{-1}\left(\frac{n+1}{n}\right)$
(C) $\tan^{-1}\left(\frac{n}{n+1}\right)$
(D) $\tan^{-1}\left(\frac{n+2}{n}\right)$

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2. The corner points of the feasible region determined by the system of linear constraints are (0, 10), (5, 5), (15, 15), (0, 20). Let $z=px+qy$, where $p,q>0$. The relation between p and q, so that the maximum z occurs at both points (15, 15) and (0, 20) is

(A) $p=q$
(B) $p=2q$
(C) $q=2p$
(D) $q=3p$

3. In Linear Programming Problem (LPP), the objective function $Z = ax + by$ has the same maximum value at two corner points. The number of points at which Z_{max} occurs is

(A) 1

(B) 2

(C) 0

(D) Infinity

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4. Probability of obtaining an even prime number on each die when a pair of dice is rolled is

(A) 0

(B) $\frac{1}{6}$

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

(D) $\frac{1}{36}$

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5. The probability that a man and his wife live after 20 years are $\frac{1}{4}$ and $\frac{1}{3}$ respectively. The probability that neither the man nor his wife live after 20 years is

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

(B) $\frac{5}{12}$

(C) $\frac{7}{12}$

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

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6. Integrating factor of the differential equation $(1-x^2)\frac{dy}{dx} - xy = 1$ is

(1) $1-x^2$

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

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

(4) $\sqrt{1-x^2}$

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7. Recent studies suggest that 12% of the world population is left handed. Depending on parents hand usage, the chances of having left handed children are as follows:

A: Both parents are left handed, chances of having left handed children = 24%

B: Both parents are right handed, chances of having left handed children = 9%

C: Father left handed and mother right handed, chances of having left handed children = 17%

D: Father right handed and mother left handed, chances of having left handed children = 22%

Given $P(A) = P(B) = P(C) = P(D) = 1/4$ and L denotes child is left handed. What is the probability that $P(A|L)$?

(1) $\frac{17}{80}$

(2) $\frac{24}{75}$

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

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

---

8. If α and β are acute angles such that $\alpha+\beta$ and $\alpha-\beta$ satisfy the equation $\tan^2\theta - 4\tan\theta + 1 = 0$, then α and β are respectively

(1) $45°, 30°$

(2) $75°, 15°$

(3) $30°, 60°$

(4) $60°, 45°$

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9. $\sum_{r=1}^{n}(r \cdot r!) =$ _____

(1) 1

(2) n

(3) $(n+1)! - 1$

(4) 0

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10. The solution of $3x - 5 < 2x - 4$ is

(1) $x < 1$

(2) $x > -1$

(3) $x < 9$

(4) $x > 9$

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11. 10 distinct points are taken on a circle. Then using these points

Statement I : The number of triangles that can be formed is 100

Statement II : The number of chords that can be formed is 45

Which of the following is correct?

(1) Both Statement I and Statement II are true

(2) Both Statement I and Statement II are false

(3) Statement I is true and Statement II is false

(4) Statement I is false and Statement II is true

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12. How many ways can you arrange all the letters and numbers in "KCET 2025" which start with K and end with 5?

(1) 720

(2) 360

(3) 120

(4) 180

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13. The value of $\lim_{x \to 2} \frac{x^3+3x^2-9x-2}{x^3-x^2-4x+4}$ **is _____**

(1) 3

(2) $\frac{15}{4}$

(3) $\frac{15}{2}$

(4) $\frac{15}{13}$

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14. If we insert two numbers between $\sqrt{2}$ **and** 4 **so that the resulting sequence is in G.P., then the inserted numbers in the order are**

(1) $4, \sqrt{2}$

(2) $2, 2\sqrt{2}$

(3) $\sqrt{8}, 2$

(4) $2\sqrt{2}, 4$

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15. Match List-I with List-II

List-I

a) A matrix which is not a square matrix

b) A square matrix $A' = A$

c) The diagonal elements of a diagonal matrix are same

d) A matrix which is both symmetric and skew symmetric

List-II

i) Symmetric matrix

ii) Null matrix

iii) Rectangular matrix

iv) Scalar matrix

Codes:

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

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

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

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

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16. Consider the following statements:

Statement I : If A is a non-singular matrix, then A^{-1} exists.

Statement II : If A and B are symmetric matrices of same order, then $(AB - BA)$ is a skew symmetric matrix.

Choose the correct option.

(1) Statement I is true and Statement II is false

(2) Statement I is false and Statement II is false

(3) Statement I is true and Statement II is true

(4) Statement I is false and Statement II is true

17. A row matrix has only

(1) One element

(2) One row with one or more columns

(3) One column with one or more rows

(4) One row and one column

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18. Let X be a matrix of order $2 \times n$ and Z be a matrix of order $2 \times p$. If $n = p$, then the order of the matrix $7X - 5Z$ is:

(1) $2 \times n$

(2) $n \times 3$

(3) $p \times 2$

(4) $p \times n$

---

19. Which of the following is correct?

(1) Determinant is a square matrix.

(2) Determinant is a number associated to a matrix.

(3) Determinant is a unique number associated to a square matrix.

(4) Determinant is not defined for a square matrix.

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20. If A and B are invertible matrices of same order, then which of the following is <u>not</u> correct?

(1) $A \cdot (\text{adj } A) = (\text{adj } A) \cdot A = |A|I$

(2) $A \cdot \text{adj } A = \text{adj } A \cdot A = |A|$

(3) $(AB)^{-1} = B^{-1}A^{-1}$

(4) $|A| \neq 0, |B| \neq 0$

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21. If A and B are invertible square matrices of order n, then which of the following is <u>not</u> correct?

(1) $\det(AB) = \det(A) \cdot \det(B)$

(2) $\det(kA) = k^n \det(A)$

(3) $\det(A+B) = \det(A) + \det(B)$

(4) $\det(A^{-1}) = \frac{1}{\det(A)}$

---

22. The area of the triangle with vertices $(3,8), (-4,2)$ and $(5,1)$ is $\frac{P}{4}$, then the value of P is

(1) $\frac{61}{2}$

(2) $\frac{2}{61}$

(3) 122

(4) $\frac{1}{122}$

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23. The system of equations $x + 2y = 3$ and $2x + 3y = 3$ has

(1) No solution

(2) Unique solution

(3) Infinite solutions

(4) Only two solutions

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24. If $\vec{a} = 2\hat{i} + 2\hat{j} - \hat{k}$, $\vec{b} = \alpha\hat{i} + \beta\hat{j} + 2\hat{k}$ and $|\vec{a} + \vec{b}| = |\vec{a} - \vec{b}|$, then $\alpha + \beta$ is equal to

(1) 2

(2) -1

(3) 0

(4) 1

---

25. If $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{b} = \hat{j} - \hat{k}$ and $\vec{a} \times \vec{c} = \vec{b}$, $\vec{a} \cdot \vec{c} = 3$, then $\vec{c}$ is

(1) $\frac{5}{3}\hat{i} + \frac{2}{3}\hat{j} - \frac{2}{3}\hat{k}$

(2) $\frac{5}{3}\hat{i} - \frac{2}{3}\hat{j} + \frac{2}{3}\hat{k}$

(3) $\frac{5}{3}\hat{i}+\frac{2}{3}\hat{j}+\frac{2}{3}\hat{k}$

(4) $\frac{5}{3}\hat{i}-\frac{2}{3}\hat{j}-\frac{2}{3}\hat{k}$

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26. The value of λ for which the vectors $\vec{a}=2\hat{i}+\lambda\hat{j}+\hat{k}$ and $\vec{b}=\hat{i}+2\hat{j}+3\hat{k}$ are orthogonal is

(1) $\frac{5}{2}$

(2) $\frac{-5}{2}$

(3) $\frac{2}{5}$

(4) $\frac{-2}{5}$

---

27. The angle between the lines whose direction ratios are a,b,c and $b-c,c-a,a-b$ is

(1) 90°

(2) 45°

(3) 30°

(4) 0°

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28. The measure of the angle between the lines $x=k-1,y=2k+1,z=2k+3,k\in\mathbb{R}$ and $\frac{x+1}{2}=\frac{y-2}{1}=\frac{z-1}{2}$ is

(1) $\cos^{-1}\left(\frac{2}{3}\right)$

(2) $\cos^{-1}\left(\frac{8}{9}\right)$

(3) $\cos^{-1}\left(\frac{5}{12}\right)$

(4) $\sin^{-1}\left(\frac{8}{9}\right)$

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29. The line L_1 joining the two points $(-1,2)$ and $(3,6)$ divides the line L_2 which passes through $(3,-1)$ in the ratio $1:3$ internally, then the equation of L_2 is

(A) $4x-3y-9=0$

(B) $4x-3y+9=0$

(C) $4x+3y-9=0$

(D) $4x+3y+9=0$

30. In the figure

Statement I : When $\alpha > \beta \geq 0$, the section is hyperbola

Statement II : When $\beta = 90°$, the section is ellipse

Which of the following is correct?

(1) Statement I is true, Statement II is false

(2) Statement I is false, Statement II is true

(3) Both the Statements are true

(4) Both the Statements are false

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31. The three points $A(2,4,3)$, $B(4,a,9)$ and $C(10,-1,7)$ form a right-angled triangle with $\angle B = 90°$, then the value of 'a' is

(1) 1 or 4

(2) -2 or 4

(3) 1 or -4

(4) -2 or -4

---

32. If $\lim_{x\to 3}\left(\frac{x^2-ax-3a}{x-3}\right) = 5$, then $a + b =$

(1) 1

(2) 2

(3) 3

(4) 4

---

33. If $f(x) = \begin{cases} x^2 - 1 & \text{if } x \geq 2 \\ x + 1 & \text{if } x < 2 \end{cases}$, then $\lim_{x\to 2^+} f(x) + \lim_{x\to 2^-} f(x) =$

(1) 7

(2) 5

(3) 6

(4) 9

---

34. If $y = \sqrt{\tan x + y}$, then $\frac{dy}{dx} =$

(1) $\frac{\sec x}{2y-1}$
(2) $\frac{\sec^2 x}{2y-1}$
(3) $\frac{\tan x}{2y-1}$
(4) $\frac{\sin^2 x}{2y-1}$

---

35. If $f(x) = \begin{cases} ax+7 & \text{if } x < 1 \\ 2x-3 & \text{if } x = 1 \\ \frac{x+b}{b} & \text{if } x > 1 \end{cases}$ is continuous at $x = 1$, then

(1) $a = 3, b = 2$
(2) $a = -8, b = -2$
(3) $a = 8, b = -2$
(4) $a = -8, b = 2$

---

36. The second order derivative of $\sec^{-1}\left(\frac{1}{2x^2-1}\right)$ with respect to $\cos^{-1}(2x^2-1)$, where $0 < x < \frac{1}{\sqrt{2}}$ is

(1) 0
(2) 1
(3) $\frac{1}{2}$
(4) -1

---

37. If $f(x) = \sin^{-1}\left(\frac{2x}{1+x^2}\right)$, then $f'\left(\frac{1}{2}\right) =$

(1) $\frac{4}{5}$
(2) $\frac{8}{5}$
(3) $\frac{2}{5}$
(4) 0

38. If $\sqrt{x}\sqrt[3]{y} = (x+y)^n$ and $x\frac{dy}{dx} - y = 0$, then $n =$

(1) 1

(2) $\frac{6}{5}$

(3) $\frac{5}{6}$

(4) $\frac{4}{9}$

---

39. In a Mahakumbh, a drone camera is moving along $3y = x^3 - 3$. When y-coordinate changes 9 times as fast as x-coordinate, it captures good quality pictures. Then one of the precise positions of the drone at that instant is

(1) $(-3, 8)$

(2) $(3, -8)$

(3) $(3, 8)$

(4) $(-3, -8)$

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40. A Youtube short video is getting viral according to $f(t) = -2t^3 + 3t^2 + 5$. At what time does the video get maximum number of shares? (t is in hours)

(1) 1

(2) 2

(3) 3

(4) 4

---

41. $\int xf(x)dx + \frac{f(x)}{2} = 0$, then $f(x)$ is equal to

(1) e^{-2x}

(2) e^{2x}

(3) e^{-x^2}

(4) e^{x^2}

---

42. One of the possible functions $f(x)$ which satisfies $\int_{-2}^{2} f(x)dx = 0$ is

(1) $\log\left(\frac{2+x}{2-x}\right)$
(2) $\sin(2+x)$
(3) $2x^3 + 2x + 1$
(4) $2x \tan x$

---

43. $\int_{a-6}^{b-6} f(x+6)dx$ is equal to

(1) $\int_a^b f(x-6)dx$
(2) $\int_a^b f(x+6)dx$
(3) $\int_a^b f(x)dx$
(4) $\int_a^b f(-x)dx$

---

44. If 'n' is a natural number, then $\int \frac{\sin^n x}{\cos^{n+2} x}dx =$

(1) $\frac{\tan^{n-1} x}{n-1} + C$
(2) $\frac{\tan^n x}{n} + C$
(3) $\frac{\tan^{n+2} x}{n+2} + C$
(4) $\frac{\tan^{n+1} x}{n+1} + C$

---

45. $\int e^{-x \log 2} 2^x dx =$

(1) $\log x + C$
(2) $x + C$
(3) $\frac{1}{x} + C$
(4) $\frac{x^2}{2} + C$

---

46. The area of the region bounded by the curve $y^2 = x^3$, the y-axis and the lines $y = 1$ and $y = 8$ is

(1) $\frac{155}{3}$ sq. units

(2) $\frac{93}{5}$ sq. units

(3) 93 sq. units

(4) 155 sq. units

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47. The area enclosed by the curve $x = \sqrt{3}\cos\theta, y = \sqrt{3}\sin\theta$ is

(1) $\sqrt{3}\pi$ sq. units

(2) 9π sq. units

(3) 6π sq. units

(4) 3π sq. units

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48. Sum of the squares of the order and degree (if defined) of a differential equation $2y' + (y'')^2 = \sqrt{y'' - 3}$ is

(1) 13

(2) 20

(3) 8

(4) 16

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49. If A = {a, b, c, d, e, f}, then the number of subsets of A which contains at least 2 elements is

(1) 64

(2) 65

(3) 57

(4) 59

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50. If A = {1, 2, 3, 4, . . . , 10}, then the number of non empty subsets of A containing only even number is

(1) 31

(2) 82

(3) 30

(4) 29

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51. The domain of the function $\sqrt{\frac{x-7}{9-x}}$ is

(1) $(7,9)$

(2) $[7,9)$

(3) $[7,9]$

(4) $(7,9]$

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52. If $n(A)=2$ and the number of relations from set A to set B is 1024, then $n(B)$ is

(1) 2

(2) 5

(3) 2^5

(4) 5^2

---

53. Probability of at least one of the events A and B occur is 0.6. If A and B occur simultaneously with probability 0.2, then $P(\bar{A})+P(\bar{B})$ is

(1) 1

(2) 0.8

(3) 0.6

(4) 1.2

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54. The maximum value of $\sin(x+\pi/6)+\cos(x+\pi/6)$ is attained at $x=$

(1) $\pi/2$

(2) $\pi/4$

(3) $\pi/6$

(4) $\pi/12$

---

55. The angles of a triangle are in A.P and the greatest angle is double the least angle, then sine of the third angle is

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

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

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

(4) 0

---

56. The mean and standard deviation of 100 items are 50 and 4, respectively then the sum of all squares of the items is

(1) 250000

(2) 251600

(3) 256100

(4) 265100

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57. Probability of occurrence of an event A is 1/2 and that of B is 3/10. If A and B are mutually exclusive, then the probability of occurrence of neither A nor B is

(1) $\frac{4}{5}$

(2) $\frac{3}{5}$

(3) $\frac{2}{5}$

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

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58. Let R be the relation in the set N given by $R = \{(a, b) : a = b - 2, b > 6\}$. Which of the following is the correct answer?

(1) $(2, 4) \in R$

(2) $(3, 8) \in R$

(3) $(6, 8) \in R$

(4) $(8, 7) \in R$

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59. $f(x) = (x+1)^2$ **for** $x \geq 1$. $g(x)$ **is a function whose graph is the reflection of the graph of** $f(x)$ **in the line** $y = x$**, then** $g(x)$ **is**

(1) $-\sqrt{x} - 1$

(2) $\sqrt{x} + 1$

(3) $\sqrt{x} - 1$

(4) $\sqrt{-x} - 1$

---

60. If $\sin^{-1} x + \sin^{-1} y = \pi/2$**, then** x^2 **is equal to**

(1) $1 - y^2$

(2) $1 + y^2$

(3) $\sqrt{1 - y^2}$

(4) $\sqrt{1 + y^2}$
