MATHS

BOOKS - SUNSTAR MATHS (KANNADA ENGLISH)

K-CET-MATHEMATICS -2019

Mcqs

1. If α and β are the roots of $x^2 + x + 1 = 0$, then $\alpha^{16} + \beta^{16} =$

A. $\frac{-1 - i\sqrt{3}}{2}$

B. 1

C. -1

D. $\frac{-1 + i\sqrt{3}}{2}$

Answer: C

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2. The number of 4 digit numbers without repetition that can be formed using the digit 1,2,3,4,5,6,7 in which each number has two odd digits and two digits is

A. 1)450

B. 2)432

C. 3)454

D. 4)436

Answer: B

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3. The number of terms in the expansion of $\left(x^2+y^2\right)^{25}-\left(x^2-y^2\right)^{25}$ after simplification is

A. 26

B. 0

C. 50

D. 13

Answer: D

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4. The third term of G.P is 9. The product if its first five terms is

A. 3^{10}

B. 3^5

C. 3^{12}

D. 3^9

Answer: A

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5. A line cuts of equal intercepts on the coordinate axes. Find the angle made by the line with the positive x - axis.

A. 120°

B. 45°

C. 135°

D. 90°

Answer: C

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6. The order of the differential equation $y = C_1 e^{c_2 + x} + C_3 e^{c_4 + x}$ is

A. 1)3

B. 2)1

C. 3)4

D. 4)2

Answer: B

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7. If $\left|\vec{a}\right| = 16, \left|\vec{b}\right| = 4, \quad \text{then}, \sqrt{\left|\vec{a} \times \vec{b}\right|^2 + \left|\vec{a} . \vec{b}\right|^2} =$

A. 16

B. 4

C. 64

D. 8

Answer: C

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8. If the angle between $\vec{a}$ and $\vec{b}$ is $2\pi/3$ and the projection of $\vec{a}$ in the direction $\vec{b}$ is -2, the $\left|\vec{a}\right| =$

A. 1)2

B. 2)4

C. 3)1

D. 4)3

Answer: B

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9. A unit vector perpendicular to the plane containing the vectors $\hat{i}+2\hat{j}+\hat{k}$ and $-2\hat{i}+\hat{j}+3\hat{k}$ is

A. 1) $\frac{-\hat{i}+\hat{j}+\hat{k}}{\sqrt{3}}$

B. 2) $\frac{\hat{i}-\hat{j}+\hat{k}}{\sqrt{3}}$

C. 3) $\frac{-\hat{i}-\hat{j}-\hat{k}}{\sqrt{3}}$

D. 4) $\frac{\hat{i}+\hat{j}-\hat{k}}{\sqrt{3}}$

Answer: A

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10. $\left[\vec{a}+2\vec{b}-\vec{c},\ \vec{a}-\vec{b},\ \vec{a}-\vec{b}-\vec{c}\right]=$

A. 1)$2\left[\vec{a},\ \vec{b},\ \vec{c}\right]$

B. 2)0

C. 3)$3\left[\vec{a},\ \vec{b},\ \vec{c}\right]$

D. 4)$\left[\vec{a},\ \vec{b},\ \vec{c}\right]$

Answer: C

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11. If $\sqrt[3]{y}\sqrt[2]{x}=\sqrt[6]{(x+y)^5}$, then `(dy)/(dx)

A. x-y

B. $\frac{x}{y}$

C. $\frac{y}{x}$

D. x+y

Answer: C

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12. Rolle's theorem is not applicable in which one of the following cases?

A. $f(x) = |x| \text{ in } [-2, 2]$

B. $f(x) = x^2 - 4x + 5 \text{ in } [1, 3]$

C. $f(x) = [x] \text{ in } [2.5, 2.7]$

D. $f(x) = x^2 - x \text{ in } [0, 1]$

Answer: A

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13. THe interval in which the function $f(x) = x^3 - 6x^2 + 9x + 10$ is increasing in

A. [1,3]

B. $(-\infty, 1) \cup (3, \infty)$

C. $(-\infty, -1) \cup (3, \infty)$

D. $(-\infty, 1] \cup [3, \infty)$

Answer: B::D

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14. The side if an equilateral triangle are increasing at the rate of 4 cm/sec. the rate at which its areais increasing, when the side is 14 cm.

A. 1)$42cm^2/\sec$

B. 2)$10\sqrt{2}cm^2/\sec$

C. 3)$14cm^2/\sec$

D. 4) $28\sqrt{3}cm^2 / \sec$

Answer:

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15. The value of $\sqrt{24.99}$ is

A. 1) 5.001

B. 2) 4.999

C. 3) 4.897

D. 4) 4.899

Answer:

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16. If $|3x - 5| \leq 2$ then

A. 1) $1 \leq x \leq \frac{9}{3}$

B. 2) $-1 \leq x \leq \frac{7}{3}$

C. 3) $-1 \leq x \leq \frac{9}{3}$

D. 4) $1 \leq x \leq \frac{7}{3}$

Answer: D

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17. If A and B are two events of a sample space S such that $P(A) = 2.0, P(B) = 0.6$ and $P(A \mid B) = 0.5$ then $P\left(A^1 \mid B\right) =$

A. 1) $\frac{1}{2}$

B. 2) $\frac{3}{10}$

C. 3) $\frac{1}{3}$

D. 4) $\frac{2}{3}$

Answer: A

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18. If 'X' has a binomial distribution with parameters n=6, p and P(X=2)=12, P(X=3)=5 then P=

A. 1) $\frac{1}{2}$

B. 2) $\frac{5}{21}$

C. 3) $\frac{5}{16}$

D. 4) $\frac{16}{21}$

Answer:

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19. A man speaks truth 2 out of 3 times. He picks one of the natural numbers in the set S={1,2,3,4,5,6,7} and reports that it is even. The probability that it is actually even is

A. 1) $\frac{1}{10}$

B. 2) $\frac{2}{5}$

C. 3) $\frac{3}{5}$

D. 4) $\frac{1}{5}$

Answer: C

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20. $\int_{-3}^{3} \cot^{-1} x dx =$

A. 6π

B. 3π

C. 3

D. 0

Answer: B

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21. $\int \frac{1}{\sqrt{x}+x\sqrt{x}}dx =$

A. $\tan^{-1}\sqrt{x}+c$

B. $2\log\left(\sqrt{x}+1\right)+C$

C. $2\tan^{-1}\sqrt{x}+C$

D. $\frac{1}{2}\tan^{-1}\sqrt{x}+C$

Answer: C

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22.

$$\int \frac{2x-1}{(x-1)(x+2)(x-3)}dx = A\log|x-1|+B\log|x+2|+C\log|x-3|$$

Then A,B,C are respectively.

A. $\frac{1}{6},\frac{-1}{3},\frac{1}{3}$

B. $\frac{-1}{6},\frac{1}{3},\frac{1}{3}$

C. $\frac{-1}{6}, \frac{-1}{3}, \frac{1}{2}$

D. $\frac{1}{6}, \frac{1}{3}, \frac{1}{5}$

Answer: C

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23. $\int_0^2 [x^2] dx =$

A. 1)$5 - \sqrt{2} + \sqrt{3}$

B. 2)$5 - \sqrt{2} - \sqrt{3}$

C. 3)$-5 - \sqrt{2} - \sqrt{3}$

D. 4)$5 + \sqrt{2} - \sqrt{3}$

Answer: B

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24. $\int_0^1 \sqrt{\frac{1+x}{1-x}}dx =$

A. 1) $\frac{\pi}{2}$

B. 2) $\frac{\pi}{2} - 1$

C. 3) $\frac{\pi}{2}$

D. 4) $\frac{\pi}{2} + 1$

Answer: D

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25. $f: R \to R$ and $g: [0, \infty] \to R$ is defined by $f(x) = x^2$ and $g(x) = \sqrt{x}$. Which one of the following is not true?

A. 1) $fog(2) = 2$

B. 2) $gof(4) = 4$

C. 3) $gof(-2) = 2$

D. 4) $fog(-4) = 4$

Answer: D

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26. If A $= \{x \mid x \in N, x \leq 5\}, B = \{x \mid x \in Z, x^2 - 5x + 6 = 0\}$, then the number of onto functions from A to B is

A. 30

B. 2

C. 32

D. 23

Answer: A

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27. On the set of positive rationals, a binary operation * is defined by a*b= $\frac{2ab}{5}$. If 2 * x=3^{-1} then x=

A. $\frac{2}{5}$

B. $\frac{1}{6}$

C. $\frac{125}{48}$

D. $\frac{5}{12}$

Answer: C

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28. $\cos\left[2\sin^{-1}\frac{3}{4}+\cos^{-1}\frac{3}{4}\right]=$

A. $\frac{3}{5}$

B. $-\frac{3}{4}$

C. Does not exist

D. $\frac{3}{4}$

Answer: B

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29. If $a + \frac{\pi}{2} < 2\tan^{-1} x + 3\cot^{-1} x < b$ then 'a'and 'b' are respectively.

A. 1)0 and 2π

B. 2)0 and π

C. 3)$\frac{-\pi}{2}$ and 2π

D. 4)$\frac{\pi}{2}$ and 2π

Answer: D

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30. Let n(U) = 700 , n (A) = 200 , n (B) = 300 and $n(A \cap B)$ =100, then $n(A' \cap B')$=

A. 90

B. 40

C. 10

D. 20

Answer: C

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31. The domain of the function $f: R \to R$ defined by $f(x) = \sqrt{x^2 - 7x + 12}$ is

A. 1)$(-\infty, 3] \cap [4, \infty)$

B. 2)$(-\infty, 3] \cup [4, \infty)$

C. 3)$(3, 4)$

D. 4)$(-\infty, 3] \cup (4, \infty)$

Answer: B

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32. If $\cos x = |\sin x|$ then, the general solution is

A. a.$x = n\pi + (-1)^n \frac{\pi}{4}, n \in Z$

B. b.$x = n\pi \pm \frac{\pi}{4}, n \in Z$

C. c.$x = (2n + 1)\pi \pm \frac{\pi}{4}, n \in Z$

D. d.$x = 2n\pi \pm \frac{\pi}{4}, n \in Z$

Answer: D

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33. Show that $\sqrt{3} \ \text{cosec} \ 20^\circ - \sec 20^\circ = 4$

A. 4

B. 2

C. 1

D. 3

Answer: A

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34. If P(n): $2^n < n!$ Then the smallest positive integer for which P(n) is true, is

A. 4

B. 2

C. 5

D. 3

Answer: A

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35. Foot of the perpendicular drawn from the point (1,3,4) to the plane $2x - y + z + 3 = 0$ is

A. (1,2,-3)

B. (-1,4,3)

C. (-3,5,2)

D. (0,-4,-7)

Answer: B

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36. Acute angle between the line $\frac{x-5}{2} = \frac{y+1}{-1} = \frac{z+4}{1}$ and the plane $3x - 4y - z + 5 = 0$ is

A. 1)$\cos^{-1}\left(\frac{5}{2\sqrt{13}}\right)$

B. 2) $\cos^{-1}\left(\frac{9}{\sqrt{364}}\right)$

C. 3) $\sin^{-1}\left(\frac{6}{2\sqrt{13}}\right)$

D. 4) $\sin^{-1}\left(\frac{9.}{\sqrt{364}}\right)$

Answer: A

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37. The distance of the point (1,2,1) from the line $\frac{x-1}{2}=\frac{y-2}{1}=\frac{z-3}{2}$ is

A. a. $\frac{\sqrt{5}}{3}$

B. b. $\frac{2\sqrt{3}}{5}$

C. c. $\frac{20}{3}$

D. d. $\frac{2\sqrt{5}}{3}$

Answer: D

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38. XY-plane divides the line joining the points A(2,3,-5) and B(-1,-2,-3) in the ratio

A. 5:3 internally

B. 2:1 internally

C. 5:3 externally

D. 3:2 externally

Answer: C

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39. The inverse of the matrix $\begin{bmatrix} 2 & 5 & 0 \\ 0 & 1 & 1 \\ -1 & 0 & 3 \end{bmatrix}$ is

A. $\begin{bmatrix} -3 & -15 & 5 \\ -1 & 6 & -2 \\ 1 & -5 & 2 \end{bmatrix}$

B. $\begin{bmatrix} -3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}$

C. $\begin{bmatrix} -3 & -15 & 5 \\ -1 & 6 & -2 \\ 1 & -5 & -2 \end{bmatrix}$

D. $\begin{bmatrix} 3 & -5 & 5 \\ -1 & -6 & -2 \\ 1 & -5 & 2 \end{bmatrix}$

Answer: A

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40. If P and Q are symmetric matrices of the same order then PQ-QP is

A. Zero matrix

B. Identity matrix

C. Skew symmetric matrix

D. Symmetric matrix

Answer: C

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41. If $3A + 4B' = \begin{bmatrix} 7 & -10 & 17 \\ 0 & 6 & 31 \end{bmatrix}$ and $2B - 3A' \begin{bmatrix} -1 & 18 \\ 4 & 0 \\ -5 & -7 \end{bmatrix}$ then $B =$

A. $\begin{bmatrix} -1 & -18 \\ 4 & -16 \\ -5 & -7 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 3 \\ -1 & 1 \\ 2 & 4 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 3 \\ -1 & 1 \\ 2 & -4 \end{bmatrix}$

D. $\begin{bmatrix} 1 & -3 \\ -1 & 1 \\ 2 & 4 \end{bmatrix}$

Answer: B

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42. If $A = \begin{bmatrix} 1 & 3 \\ 4 & 2 \end{bmatrix}, B = \begin{bmatrix} 2 & -1 \\ 1 & 2 \end{bmatrix}$, then $|ABB'| =$

A. 100

B. 50

C. 250

D. -250

Answer: D

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43. If the value of a third order determinant is 16, then the value of the determinant formed by replacing each of its elements by its cofactor is

A. 256

B. 96

C. 16

D. 48

Answer: A

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44. The eccentricity of the ellipse $9x^2 + 25y^2 = 225$ is

A. $\frac{3}{4}$

B. $\frac{4}{5}$

C. $\frac{9}{16}$

D. $\frac{3}{5}$

Answer: B

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45.

$$\sum_{r=1}^{n}(2r-1) = x \quad \text{then} \quad \lim_{n\to\infty}\left[\frac{1^3}{x^2} + \frac{2^3}{x^2} + \frac{3^3}{x^2} + \ldots\ldots + \frac{n^3}{x^2}\right] =$$

A. 1)1

B. 2) $\frac{1}{2}$

C. 3)4

D. 4) $\frac{1}{4}$

Answer: D

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46. The negative of the statement "All continuous functions are differentiable".

A. Some continuous functions are not differentiable

B. All continuous functions are not differentiable

C. All continuous functions are differentiable

D. Some continuous functions are differentiable

Answer: A

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47. Mean and standard deviation of 100 items are 50 and 4 respectively. The sum of all squares of the items is

A. 266000

B. 251600

C. 261600

D. 256100

Answer: B

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48. Two letters are chosen from the letters of the word 'EQUATIONS'. The probability that one is vowel and the other is consonant is

A. 1) $\frac{3}{9}$

B. 2) $\frac{8}{9}$

C. 3) $\frac{5}{9}$

D. 4) $\frac{4}{9}$

Answer: C

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49. $\int \mathrm{x}^3 \sin 3x dx =$

A. 1) $-\frac{x^3.\cos 3x}{3} + \frac{x^2 \sin 3x}{3} + \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$

B. 2) $-\frac{x^3 \cos 3x}{3} - \frac{x^2 \sin 3x}{3} + \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$

C. 3) $-\frac{x^3 \cos 3x}{3} + \frac{x^2 \sin 3x}{3} - \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$

D. 4) $\frac{x^3 \cos 3x}{3} + \frac{x^2 \sin 3x}{3} - \frac{2x \cos 3x}{9} - \frac{2 \sin 3x}{27} + C$

Answer: A

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50. The area of the region above X-axis included between the parabola $y^2 = x$ and the circle $x^2 + y^2 = 2x$ in square units is

A. 1: $\frac{2}{3} - \frac{\pi}{4}$

B. 2: $\frac{\pi}{4} - \frac{3}{2}$

C. 3: $\frac{\pi}{4} - \frac{2}{3}$

D. 4: $\frac{3}{2} - \frac{\pi}{4}$

Answer: C

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51. The area of the region bounded by Y-axis, y=cos x and y = $\sin \times 0 \leq x \leq \frac{\pi}{2}$ is

A. 1)$\sqrt{2} + 1$ Sq.units

B. 2)$\sqrt{2} - 1$ Sq.units

C. 3)$2 - \sqrt{2}$ Sq.units

D. $4)\sqrt{2}$ Sq.units

Answer: B

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52. The integrating factor of the differential equation $\left(2x+3y^2\right)dy = ydx(y>0)$ is

A. $\frac{1}{x}$

B. $\frac{1}{e^y}$

C. $\frac{1}{y^2}$

D. $-\frac{1}{y^2}$

Answer: C

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53. The equation of the curve passing through the point (1,1) such that the slope of the tangent at any point (x,y) is equal to the product of its co-ordinates is

A. $2\log y = x^2 - 1$

B. $2\log x = y^2 - 1$

C. $2\log x = y^2 + 1$

D. $2\log y = x^2 + 1$

Answer: A

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54. The constant term in the expansion of $\begin{bmatrix} 3x+1 & 2x-1 & x+2 \\ 5x-1 & 3x+2 & x+1 \\ 7x-2 & 3x+1 & 4x-1 \end{bmatrix}$ is

A. -10

B. 0

C. 6

D. 2

Answer: C

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55. If [x] represents the greatest integer function and $f(x) = x - [x] - \cos x$ then $f^1\left(\frac{\pi}{2}\right) =$

A. 1)2

B. 2)0

C. 3)does not exist

D. 4)1

Answer: A

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56. If $f(x) = \left\{ \left(\frac{\sin 3x}{e^{2x} - 1}, , , x \neq 0 \right), (k - 2, :, x = 0) \right.$ is

Continuous at x=0, then k=

A. 1) $\frac{7}{2}$

B. 2) $\frac{3}{2}$

C. 3) $\frac{2}{3}$

D. 4) $\frac{9}{5}$

Answer:

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57. If $f(x) = \sin^{-1}\left[\frac{2^{x+1}}{1+4^x}\right]$, then $f^1(0) =$

A. $\frac{2\log 2}{5}$

B. $2\log 2$

C. $\frac{4\log 2}{5}$

D. $\log 2$

Answer:

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58. If $x = a\sec^2\theta, y = a\tan^2\theta$ then $\frac{d^2y}{dx^2} =$

A. 0

B. 2a

C. 4

D. 1

Answer: A

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