MATHS

BOOKS - SUNSTAR MATHS (KANNADA ENGLISH)

K-CET- MATHEMATICS - 2017

Mcqs

1. If A and B are finite sets and $A \subset B$ then

A. $n(A \cup B) = n(A)$

B. $n(A \cap B) = n(B)$

C. $n(A \cup B) = n(B)$

D. $n(A \cap B) = \phi$

Answer: C

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2. The value of $\cos^2 45^\circ - \sin^2 15^\circ$ is

A. $\frac{\sqrt{3}}{2}$

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

C. $\frac{\sqrt{3}+1}{2\sqrt{2}}$

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

Answer: B

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3. $3 + 5 + 7 +$ .....sum to n terms

A. $n(n+2)$

B. $n(n-2)$

C. n^2

D. $(n+1)^2$

Answer: A

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4. If $\left(\frac{1+i}{1-i}\right)^m = 1$, then find the least positive integral value of m.

A. 2

B. 3

C. 4

D. 1

Answer: C

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5. If $|x-2| \leq 1$, then

A. $x \in [1, 3]$

B. $x \in (1, 3)$

C. $x \in [-1, 3)$

D. $x \in (-1, 3)$

Answer: A

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6. If ${}^{n}C_{12} = {}^{n}C_{8}$, then n is equal to :

A. 26

B. 12

C. 6

D. 20

Answer: D

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7. The total number of terms in the expansion of $(x+a)^{47}-(x-a)^{47}$ after simplification is

A. 24

B. 47

C. 48

D. 96

Answer:

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8. Equation of line passing through the point (1, 2) and perpendicular to the line $y = 3x - 1$ is

A. 1.$x + 3y - 7 = 0$

B. 2.$x + 3y + 7 = 0$

C. 3.$x + 3y = 0$

D. 4.$x - 3y = 0$

Answer: A

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9. The eccentricity to the ellipse $\frac{x^2}{36} + \frac{y^2}{16} = 1$ is

A. 1. $\frac{2\sqrt{5}}{6}$

B. 2. $\frac{2\sqrt{5}}{4}$

C. 3. $\frac{2\sqrt{13}}{6}$

D. 4. $\frac{2\sqrt{13}}{4}$

Answer: A

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10. The perpendicular distance of the point P (6, 7, 8) from XY - plane is

A. 1)8

B. 2)7

C. 3)6

D. 4)5

Answer: A

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11. The value of $\lim_{\theta \to 0} \frac{1 - \cos 4\theta}{1 - \cos 6\theta}$ is

A. $1.4/9$

B. $2.9/4$

C. $3.9/3$

D. $4.3/4$

Answer: A

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12. Write the contrapositive and converse of the following statements.

If x is a prime number, then x is odd.

A. If x is not a prime number, then x is not odd

B. If x is a prime number, then x is not odd

C. If x is not a prime number, then x is odd

D. If x is not odd, then x is not a primer number

Answer: D

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13. If the coefficient of variation and standard deviation are 60 and 21 respectively, the arithmetic mean of distribution is

A. 40

B. $7/20$

C. $20/7$

D. $1/40$

Answer: A

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14. The range of the function $f(x) = \sqrt{9 - x^2}$ is

A. 1.(0, 3)

B. 2.[0, 3]

C. 3.(0, 3]

D. 4.[0, 3)

Answer: B

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15. Let f : R $\rightarrow$ R be defined by $f(x) = x^4$, then

A. 1.f is one - one and onto

B. 2.f may be one - one and onto

C. 3.f is one - one but not onto

D. 4.f is neither one - one nor onto

Answer: D

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16. The range of $\sec^{-1} x$ is

A. $\left[\frac{-\pi}{2}, \frac{\pi}{2}\right]$

B. $\left(\frac{-\pi}{2}, \frac{\pi}{2}\right)$

C. $[0, \pi]$

D. $[0, \pi] - \left\{\frac{\pi}{2}\right\}$

Answer: A

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17. If $\tan^{-1} x + \tan^{-1} y = 4\pi/5$, then $\cot^{-1} x + \cot^{-1} y$ is equal to

A. $1.\pi$

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

C. $3.\frac{2\pi}{5}$

D. $4.\frac{3\pi}{5}$

Answer: B

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18. If $f(x) = 8x^3$, $g(x) = x^{1/3}$, then fog (x) is

A. 1.8x

B. $28^3 x$

C. 3.$(8x)^{1/3}$

D. 4.$8x^3$

Answer: A

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19. If $A = \frac{1}{\pi}\begin{bmatrix} \sin^{-1}(x\pi) & \tan^{-1}\left(\frac{x}{\pi}\right) \\ \sin^{-1}\left(\frac{x}{\pi}\right) & \cot^{-1}(\pi x) \end{bmatrix}$

$B = \frac{1}{\pi}\begin{bmatrix} -\cos^{-1}(x\pi) & \tan^{-1}\left(\frac{x}{\pi}\right) \\ \sin^{-1}\left(\frac{x}{\pi}\right) & -\tan^{-1}(\pi x) \end{bmatrix}$

then $A - B$ is equal to :

A. I

B. O

C. 2I

D. $1/2I$

Answer:

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20. If the matrix A is both symmetric and skew symmetric, then

A. A is diagonal matrix

B. A is a zero matrix

C. A is scalar matrix

D. A is square matrix

Answer: B

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21. Find x and y, if $2\begin{bmatrix}1 & 3\\0 & x\end{bmatrix}+\begin{bmatrix}y & 0\\1 & 2\end{bmatrix}=\begin{bmatrix}5 & 6\\1 & 8\end{bmatrix}$

A. x = 3, y = 3

B. $x = -3, y = 3$

C. $x = 3, y = -3$

D. $x = -3, y = -3$

Answer: A

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22. Binary operation * on R $-\{-1\}$ defined by $a * b = \frac{a}{b+1}$ is

A. * is associative and commutative

B. * is associative but not commutative

C. * is neither associative nor commutative

D. * is commutative but not associative

Answer: C

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23. find the value of x for which $\begin{vmatrix} 3 & x \\ x & 1 \end{vmatrix} = \begin{vmatrix} 3 & 2 \\ 4 & 1 \end{vmatrix}$

A. 2

B. 4

C. 8

D. $\pm 2\sqrt{2}$

Answer: D

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24. If A is a square matrix of order 3×3, then |KA| is equal to

A. 1.K|A|

B. 2.$K^2|A|$

C. 3.$K^3|A|$

D. 4.3 K|A|

Answer: C

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25. The area of triangle with vertices (K, 0), (4,0), (0, 2) is 4 square units, then value of K is

A. 0 or 8

B. 0 ot -8

C. 0

D. 8

Answer: A

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26. Let $\Delta = \begin{vmatrix} Ax & x^2 & 1 \\ By & y^2 & 1 \\ Cz & z^2 & 1 \end{vmatrix}$ and $\Delta_1 = \begin{vmatrix} A & B & C \\ x & y & z \\ zy & zx & xy \end{vmatrix}$ then

A. 1.$\Delta_1 = -\Delta$

B. 2.$\Delta_1 = \Delta$

C. 3.$\Delta_1 \neq \Delta$

D. 4.$Dela_1 = 2\Delta$

Answer: B

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27. If $f(x) = \begin{cases} Kx^2 & \text{if x} \leq 2 \\ 3 & \text{if x} > 2 \end{cases}$ is continuous at x = 2, then the value of K is

A. 1)3

B. 2)4

C. 3)$3/4$

D. 4)$4/3$

Answer: C

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28. The value of C in mean value theorem for the function $f(x) = x^2$ in [2, 4] is

A. 1)3

B. 2)2

C. 3)4

D. 4)$7/2$

Answer: A

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29. The point on the curve $y^2 = x$, where the tangent makes an angle of $\frac{\pi}{4}$ with x-axis is :

A. $\left(\frac{1}{2}, \frac{1}{4}\right)$

B. $\left(\frac{1}{4}, \frac{1}{2}\right)$

C. (4, 2)

D. (1, 1)

Answer: B

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30. The function $f(x) = x^2 + 2x - 5$ is strictly increasing in the interval

A. $(-1, \infty)$

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

C. $(1, \infty)$

D. $(-\infty, -1)$

Answer: A

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31. The rate of change of volume of a sphere with respect to its surface area when the radius is 4 cm is

A. $4cm^3/cm^2$

B. $2cm^3/cm^2$

C. $6cm^3/cm^2$

D. $8cm^3/cm^2$

Answer: B

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32. If $y = \tan^{-1}\left(\frac{\sin x + \cos x}{\cos x - \sin x}\right)$, then $\frac{dy}{dx}$ is equal to

A. $1/2$

B. $\pi/4$

C. 0

D. 1

Answer: D

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33. If $y = \begin{vmatrix} f(x) & g(x) & h(x) \\ 1 & m & n \\ a & b & c \end{vmatrix}$, then $\frac{dy}{dx}$ is equal to

A. 1. $\begin{vmatrix} f^1(x) & g^1(x) & h^1(x) \\ 1 & m & n \\ a & b & c \end{vmatrix}$

B. 2. $\begin{vmatrix} 1 & m & n \\ f^1(x) & g^1(x) & h^1(x) \\ a & b & c \end{vmatrix}$

C. 3. $\begin{vmatrix} f^1(x) & 1 & a \\ g^1(x) & m & b \\ h^1(x) & n & c \end{vmatrix}$

D. 4. $\begin{vmatrix} 1 & m & n \\ a & b & c \\ f^1(x) & g^1(x) & h^1(x) \end{vmatrix}$

Answer: A::C::D

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34. If $\sin x = \frac{2t}{1+t^2}$, $\tan y = \frac{2t}{1-t^2}$, then $\frac{dy}{dx}$ is equal to

A. 1)1

B. 2)0

C. 3)-1

D. 4)2

Answer: A

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35. The derivative of $\cos^{-1}\left(2x^2-1\right)$ w.r.t $\cos^{-1}$ x is

A. 1.2

B. 2.$\frac{-1}{2\sqrt{1-x^2}}$

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

D. 4.$1-x^2$

Answer: A

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36. If y = log (log x) then $\frac{d^2y}{dx^2}$ is equal to

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

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

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

D. 4. $\frac{(1+\log x)}{x^2\log x}$

Answer: A

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37. $\int\frac{(x+3)e^x}{(x+4)^2}dx$ is equal to

A. 1. $\frac{1}{(x+4)^2}+C$

B. 2. $\frac{e^x}{(x+4)^2}+C$

C. 3. $\frac{e^x}{(x+4)}+C$

D. 4. $\frac{e^x}{(x+3)}+C$

Answer: C

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38. Evalute : $\int \frac{\cos 2x-\cos 2\alpha}{\cos x-\cos \alpha}dx.$

A. $2(\sin x+x\cos\theta)+C$

B. $2(\sin x-x\cos\theta)+C$

C. $2(\sin x+2x\cos\theta)+C$

D. $2(\sin x-2x\cos\theta)+C$

Answer: A

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39. $\int \sqrt{x^2+2x+5}dx$ is equal to

A. 1.

$$\frac{1}{2}(x+1)\sqrt{x^2+2x+5}+2\log\left|x+1+\sqrt{x^2+2x+5}\right|+C$$

B. 2.

$$(x+1)\sqrt{x^2+2x+5}+\log\mid x+1\sqrt{x^2+2x+5}\mid+C$$

C. 3.

$$(x+1)\sqrt{x^2+2x+5}-2\log\left|x+1+\sqrt{x^2+2x+5}\right|+C$$

D. 4.

$$(x+1)\sqrt{x^2+2x+5}+\frac{1}{2}\log\left|x+1+\sqrt{x^2+2x+5}\right|+C$$

Answer: A

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40. $\int_0^{\pi/2} \frac{\tan^7 x}{\cot^7 x + \tan^7 x} dx$ is equal to

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

B. 2. $\frac{\pi}{4}$

C. 3. $\frac{\pi}{6}$

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

Answer: B

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41. $\int_{-5}^{5} |x+2| dx$ is equal to

A. 1)29

B. 28

C. 3)27

D. 4)30

Answer: A

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42. $\int_{-\pi/2}^{\pi/2} \frac{dx}{e^{\sin x}+1}$ is equal to

A. 0

B. 1

C. $-\frac{\pi}{2}$

D. $\frac{\pi}{2}$

Answer: D

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43. $\int_0^{\pi/2} \frac{1}{a^2.\sin^2 x + b^2.\cos^2 x} dx$ is equal to

A. 1. $\frac{\pi a}{4b}$

B. 2. $\frac{\pi a}{2b}$

C. 3 $\frac{\pi b}{4a}$

D. 4. $\frac{\pi}{2ab}$

Answer: D

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44. Find the area of the region bounded by the curve $y = x^2$ and the line y = 2.

A. $\frac{32}{3}$ sq.units

B. $\frac{256}{3}$ sq.units

C. $\frac{64}{3}$ sq.units

D. $\frac{128}{3}$ sq.units

Answer: B

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45. Area of the region bounded by the curve y = cos x, x = 0 and $x = \pi$ is

A. 1)2 sq.units

B. 2)4 sq.units

C. 3)3 sq.units

D. 4)1 sq.units

Answer: A

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46. The degree of the differential equation $\left[1+\left(\frac{dy}{dx}\right)^2\right]^2=\frac{d^2y}{dx^2}$

A. 1

B. 2

C. 3

D. 4

Answer: A

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47. General solution of differential equation $\frac{dy}{dx} + y = 1(y \neq 1)$ is

A. $\log\left|\frac{1}{1-y}\right| = x + C$

B. $\log|1-y| = x + C$

C. $\log|1+y| = x + C$

D. $\log\left|\frac{1}{1-y}\right| = -x + C$

Answer: A

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48. The integrating factor of the differential equation $x.\frac{dy}{dx}+2y=x^2$ is $(x\neq 0)$

A. x^2

B. log |x|

C. $e^{\log x}$

D. x

Answer: A

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49. If $\overrightarrow{a}=2\hat{i}+\lambda\hat{j}+\hat{k}$ and $\overrightarrow{b}=-\hat{i}+2\hat{j}-3\hat{k}$ are orthogonal, then value of λ is

A. 0

B. 1

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

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

Answer: D

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50. If $\vec{a}, \vec{b}, \vec{c}$ are unit vectors such that $\vec{a} + \vec{b} + \vec{c} = 0$, then the value of $\vec{a} . \vec{b} + \vec{b} . \vec{c} + \vec{c} . \vec{a}$ is equal to

A. 1

B. 3

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

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

Answer: C

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51. If $\vec{a}$ and $\vec{b}$ are unit vectors, then what is the angle between $\vec{a}$ and $\vec{b}$ for $\sqrt{3}veva - \vec{b}$ to be a unit vectors ?

A. 30°

B. 45°

C. 60°

D. 90°

Answer: A

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52. Reflexion of the point (α, β, γ) in XY plane is

A. 1.$(\alpha, \beta, 0)$

B. 2.$(0, 0, \gamma)$

C. 3.$(-\alpha, -\beta, \gamma)$

D. 4.$(\alpha, \beta, -\gamma)$

Answer: D

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53. The plane $2x - 3y + 6z - 11 = 0$ makes an angle $\sin^{-1}(\alpha)$ with X - axis. The value of α is equal to

A. $\frac{\sqrt{3}}{2}$

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

C. $\frac{2}{7}$

D. $\frac{3}{7}$

Answer: C

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54. The distance of the point (-2, 4, -5) from the line $\frac{x+3}{3} = \frac{y-4}{5} = \frac{z+8}{6}$ is

A. $\frac{\sqrt{37}}{10}$

B. $\sqrt{\frac{37}{10}}$

C. $\frac{37}{\sqrt{10}}$

D. $\frac{37}{10}$

Answer: B

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55. A box has 100 pens of which 10 are defective. The probability that out of a sample of 5 pens drawn one by one with replacement and atmost one is defective is

A. $a.\ \frac{9}{10}$

B. $b.\ \frac{1}{2}\left(\frac{9}{10}\right)^4$

C. $c.\left(\frac{9}{10}\right)^5+\frac{1}{2}\left(\frac{9}{10}\right)^4$

D. $d.\frac{1}{2}\left(\frac{9}{10}\right)^5$

Answer: C

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56. Two events A and B will be independent if

A. A and B are mutually exclusive

B. $P(A' \cap B') = (1 - P(A))(1 - P(B))$

C. $P(A) - P(B)$

D. $P(A) + P(B) = 1$

Answer: B

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57. The probability distribution of x is

x	0	1	2	3
$P(x)$	0.2	k	k	$2k$

A. 0.14

B. 0.3

C. 0.7

D. 1

Answer: A

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58. If an LPP admits optimal solution at two consecutive vertices of a feasible region, then

A. the required optimal solution is at the midpoint of the line joining the two points

B. the optimal solution occurs at every point on the line joining these two points

C. the LPP under consideration is not solvable

D. the LPP under consideration must be reconstructed

Answer: B

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59. $\int_{0.2}^{3.5} [x]dx$ is equal to

A. 1)4

B. 2)4.5

C. 3)3.5

D. 4)3

Answer: B

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