MATHS

BOOKS - SUNSTAR MATHS (KANNADA ENGLISH)

K-CET-MATHEMATICS -2018

Multiple Choice Questions

1. The image of the point (1,6,3) in the line $\frac{x}{1} = \frac{y-1}{2} = \frac{z-2}{3}$ is

A. (1,0,7)

B. (7,0,1)

C. (2,7,0)

D. (-1,-6,-3)

Answer: A

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2. The angle between the lines $2x = 3y = -z$ and $6x = -y = 04z$ is

A. 0°

B. 45°

C. 90°

D. 30°

Answer: C

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3. The line $\frac{x-4}{1} = \frac{y-2}{1} = \frac{z-k}{2}$ lies exactly on the plane 2x-4y+z=7 , then the value of k is :

A. -7

B. 4

C. -4

D. 7

Answer: D

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4. The locus represented by $xy + yz = 0$ is

A. 1.a pair of perpendicular lines

B. 2.a pair of parallel lines

C. 3.a pair of parallel planes

D. 4.a pair of perpendicular planes

Answer: D

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5. For the LPP, maximise $z = x + 4y$ subject to the constraints $x + 2y \leq 2, x + 2y \geq 8, x, y \geq 0$.

A. $z_{\max} = 4$

B. $z_{\max} = 8$

C. $z_{\max} = 16$

D. Has no feasible solution

Answer: D

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6. A bag contains 17 tickets numbered from 1 to 17. A ticket is drawn at random, the another ticket is drawn without replacing the first one. The probability that both the tickets may show even number is

A. $\frac{7}{34}$

B. $\frac{8}{17}$

C. $\frac{7}{16}$

D. $\frac{7}{17}$

Answer: A

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7. A flash light has 10 batteries out of which 4 are dead. If 3 batteries are selected without replacement and tested, then the probability that all 3 are dead is

A. 1) $\frac{1}{30}$

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

C. 3) $\frac{1}{15}$

D. 4) $\frac{1}{10}$

Answer: A

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8. If $|x+5| \geq 10$ then

A. $x \in (-15, 5]$

B. $x \in (-5, 5]$

C. $x \in (-\infty, -15] \cup [5, \infty)$

D. $x \in [-\infty, -15] \cup [5, \infty)$

Answer: C

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9. Everybody in a room shakes hand with everybody else. The total number of handshakes is 66. The total number of persons in the room is :

A. 9

B. 10

C. 5

D. 15

Answer: B

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10. The constant term in the expansion of $\left(x^2 - \frac{1}{x^2}\right)^{16}$ is

A. 1. ${}^{16}C_8$

B. 2. ${}^{16}C_7$

C. 3. ${}^{16}C_9$

D. 4). ${}^{16}C_{10}$

Answer: A

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11. If P(n):''$2^{2n}-1$ is divisible by k for all $n \in N$'' is true, then the value of 'K' is

A. 1)6

B. 2)3

C. 3)7

D. 4)2

Answer: B

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12. The equation of the line parallel to the line $3x - 4y + 2 = 0$ and passing through (-2,3) is

A. 1)$3x - 4y + 18 = 0$

B. 2)$3x - 4y - 18 = 0$

C. 3)$3x + 4y + 18 = 0$

D. 4)$3x + 4y - 18 = 0$

Answer: A

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13. If $\left(\frac{1-i}{1+i}\right)^{96} = a + ib$, then (a,b) is

A. (1,1)

B. (1,0)

C. (0,1)

D. (0,-1)

Answer: B

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14. The distance between the foci of a hyperbola is 16 and its eccentricity is $\sqrt{2}$. Its equation is :

A. $x^2 - y^2 = 32$

B. $\frac{x^2}{4} - \frac{y^2}{9} = 1$

C. $2x^2 - 2y^2 = 7$

D. $y^2 - x^2 = 32$

Answer: A

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15. The number of the ways in which 5 girls and 3 boys can be seated in a row so that no two boys are together is

A. 14040

B. 14440

C. 14000

D. 14400

Answer: D

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16. If a,b,c are three consevutive terms of an AP and x,y,z are three consecutive terms of a GP, then the value of $X^{b-c}.Y^{c-a}.Z^{a-b}$ is

A. 1)0

B. 2)xyz

C. 3)-1

D. 4)1

Answer: D

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17. The value of $\lim_{x \to 0} \frac{|x|}{x}$ is

A. 1

B. -1

C. 0

D. Does not exist

Answer: D

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18. Let $f(x) = x - \frac{1}{x}$ then $f'(-1)$

A. 1)0

B. 2)2

C. 3)1

D. 4)-2

Answer: B

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19. The negation of the statement ' 72 is divisible by 2 and 3' is

A. 72 is not divisible by 2 or 72 is not divisible by 3

B. 72 is divisible by 2 or 72 is divisible by 3

C. 72 is divisible by 2 and 72 is divisible by 3

D. 72 is not divisible by 2 and 3

Answer: A

20. The probability of happening of an event A is 0.5 and that of B is 0.3. If A and B are mutually exclusive events, then the probability of neither A nor B is

A. 0.4

B. 0.5

C. 0.2

D. 0.9

Answer: C

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21. In a simultaneous throw of a pair of dice, the probability of getting a total more than 7 is

A. $\frac{7}{12}$

B. $\frac{5}{36}$

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

D. $\frac{7}{36}$

Answer: C

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22. If A and B are mutually exclusive events, given that $P(A) = \frac{3}{5}, P(B) = \frac{1}{5}$, then P(A or B) is

A. 0.8

B. 0.6

C. 0.4

D. 0.2

Answer: A

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23. Let f,g:$R \to R$ be two functions defined as $f(x) = |x| + x$ and $g(x) = |x| - x \forall x \in R.$ Then f(g) (x) for $x < 0$ is

A. 1)0

B. 2)4x

C. 3)-4x

D. 4)2x

Answer: C

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24. A is a set having 6 distinct elements. The number of distinct functions from A to A which are not bijections is

A. 1)$6! - 6$

B. 2)$6^6 - 6$

C. 3)$6^6 - 6!$

D. 4)$6!$

Answer: C

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25. Let f: $R \to R$ be defined by

$$f(x) = \begin{cases} 2x & x > 3 \\ x^2 & 1 < x \leq 3 \\ 2x & x \leq 1 \end{cases}$$

Then $f(-1) + f(2) + f(4)$ is

A. 1)9

B. 2)14

C. 3)5

D. 4)10

Answer: A

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26. If $\sin^{-1} x + \cos^{-1} y = \frac{2\pi}{5}$, then $\cos^{-1} x + \sin^{-1} y$ is

A. 1) $\frac{2\pi}{5}$

B. 2) $\frac{3\pi}{5}$

C. 3) $\frac{4\pi}{5}$

D. 4) $\frac{3\pi}{10}$

Answer: B

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27. The value of the expression $\tan\left(\frac{1}{2}\cos^{-1}\frac{2}{\sqrt{5}}\right)$ is

A. $2-\sqrt{5}$

B. $\sqrt{5}-2$

C. $\frac{\sqrt{5}-2}{2}$

D. $5-\sqrt{2}$

Answer: B

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28. if $A=\begin{bmatrix}2 & -2\\ -2 & 2\end{bmatrix}$, then $A^n=2^kA$, where k=

A. 2^{n-1}

B. n+1

C. n-1

D. $2(n-1)$

Answer: D

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29. If $\begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 2 \\ 4 \end{bmatrix}$,then the values of x and y respectively are

A. -3,-1

B. 1,3

C. 3,1

D. -1, 3

Answer: D

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30. If $A = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$, then verify that $A'A = I$

A. A

B. Zero matrix

C. A'

D. I

Answer: D

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31. If $x, y, z \in R$, then the value of determinant

$$\begin{vmatrix} \left(5^x + 5^{-x}\right)^2 & \left(5^x - 5^{-x}\right)^2 & 1 \\ \left(6^x + 6^{-x}\right)^2 & \left(6^x - 6^{-x}\right)^2 & 1 \\ \left(7^x + 7^{-x}\right)^2 & \left(7^x - 7^{-x}\right)^2 & 1 \end{vmatrix}$$ is

A. 10

B. 12

C. 1

D. 0

Answer: D

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32. The value of determinant

$$\begin{vmatrix} a-b & b+c & a \\ b-a & c+a & b \\ c-a & a+b & c \end{vmatrix}$$ is

A. 1.$a^3+b^3+c^3$

B. 2.3abc

C. 3.$a^3+b^3+c^3-3abc$

D. 4.$a^3+b^3+c^3+3abc$

Answer:

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33. If $(x_1, y_1), (x_2, y_2)$ and (x_3, y_3) are the vertices of a triangle whose area is 'k' square units, then $\begin{vmatrix} x_1 & y_1 & 4 \\ x_2 & y_2 & 4 \\ x_3 & y_3 & 4 \end{vmatrix}^2$ is

A. 1)$32k^2$

B. 2)$16k^2$

C. 3)$64k^2$

D. 4)$48k^2$

Answer: C

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34. Let A be a square matrix of order 3×3 then $|5A| =$

A. $5|A|$

B. $125|A|$

C. $25|A|$

D. $15|A|$

Answer: B

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35. If $f(x) = \begin{cases} \frac{\sqrt{1+kx} - \sqrt{1-kx}}{x} \\ \frac{2x+1}{x-1} \end{cases}$ if $-1 \leq x < 0$ is continuous at x=0, then the value of

A. k=1

B. k=-1

C. k=0

D. k=2

Answer: B

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36. If $\cos y = x\cos(a+y)$ with $\cos a \neq \pm 1$, then $\frac{dy}{dx}$ is equal to

A. 1. $\frac{\sin a}{\cos^2(a+y)}$

B. 2. $\frac{\cos^2(a+y)}{\sin a}$

C. 3. $\frac{\cos a}{\sin^2(a+y)}$

D. 4. $\frac{\cos^2(a+y)}{\cos a}$

Answer: B

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37. If $f(x) = |\cos x - \sin x|$, then $f^1\left(\frac{\pi}{6}\right)$ is equal to

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

B. 2) $\frac{1}{2}(1+\sqrt{3})$

C. 3) $-\frac{1}{2}(1-\sqrt{3})$

D. 4) $\frac{1}{2}(1-\sqrt{3})$

Answer: A

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38. If $y = \sqrt{x + \sqrt{x + \sqrt{x + \ldots\ldots\ldots\infty}}}$, m then $\frac{dy}{dx} =$

A. 1) $\frac{1}{y^2 - 1}$

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

C. 3) $\frac{2y}{y^2 - 1}$

D. 4) $\frac{1}{2y - 1}$

Answer: D

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39. if $f(x) = \begin{cases} \frac{\log_e x}{x-1} & x \neq 1 \\ k & x = 1 \end{cases}$ is continuous at x=1, then the value of k is

A. 1)e

B. 2)1

C. 3)-1

D. 4)0

Answer: B

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40. Approximate change in the volume V of a cube of side x metres caused by increasing the side be 3% is

A. $0.09x^3m^3$

B. $0.03x^3m^3$

C. $0.06x^3m^3$

D. $0.04x^3m^3$

Answer: A

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41. The maximum value of $\left(\frac{1}{x}\right)^x$ is

A. 1)e

B. 2)e^e

C. 3)$e^{1/e}$

D. 4)$\left(\frac{1}{e}\right)^{1/e}$

Answer: C

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42. $f(x) = x^x$ has a stationary point at :

A. x=e

B. $x = \frac{1}{e}$

C. x=1

D. $x = \sqrt{e}$

Answer: B

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43. The maximum area of a rectangle inscribed in the circle $(x+1)^2 + (y-3)^2 = 64$ is

A. 64 sq. units

B. 72 sq. units

C. 128 sq. units

D. 8 sq. units

Answer: C

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44. $\int \frac{1}{1+e^x} dx$ is equal to

A. $\log_e\left(\frac{e^x+1}{e^x}\right)+c$

B. $\log_e\left(\frac{e^x-1}{e^x}\right)+c$

C. $\log_e\left(\frac{e^x}{e^x+1}\right)+c$

D. $\log_e\left(\frac{e^x}{e^x-1}\right)+c$

Answer: C

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45. $\int \frac{1}{\sqrt{3-6x-9x^2}}dx$ is equal to

A. $\sin^{-1}\left(\frac{3x+1}{2}\right)+c$

B. $\sin^{-1}\left(\frac{3x+1}{6}\right)+c$

C. $\frac{1}{3}\sin^{-1}\left(\frac{3x+1}{2}\right)+c$

D. $\sin^{-1}\left(\frac{2x+1}{3}\right)+c$

Answer: C

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46. $\int e^{\sin x}.\left(\frac{\sin x+1}{\sec x}\right)dx$ is equal to

A. $\sin x . e^{\sin x} + c$

B. $\cos x . e^{\sin x} + c$

C. $e^{\sin x} + c$

D. $e^{\sin x}(\sin x + 1) + c$

Answer: A

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47. $\int_{-2}^{2} |x \cos \pi x| dx$ is equal to :

A. $\frac{8}{\pi}$

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

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

D. $\frac{1}{\pi}$

Answer: A

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48. $\int_0^1 \frac{dx}{e^x + e^{-x}}$ is equal to

A. $\frac{\pi}{4} - \tan^{-1}(e)$

B. $\tan^{-1}(e) - \frac{\pi}{4}$

C. $\tan^{-1}(e) + \frac{\pi}{4}$

D. $\tan^{-1}(e)$

Answer: B

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49. $\int_0^{1/2} \frac{dx}{(1+x^2)\sqrt{1-x^2}}$ is equal to

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

B. $\frac{2}{\sqrt{2}}\tan^{-1}\left(\frac{3}{\sqrt{2}}\right)$

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

D. $\frac{\sqrt{2}}{2}\tan^{-1}\left(\frac{\sqrt{3}}{2}\right)$

Answer: A

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

A. 1 sq. unit

B. 4 sq. units

C. 2 sq. units

D. 3 sq. units

Answer: C

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51. The area bounded by the line y=x,x-axis and ordinates x=-1 and x=2 is

A. 1) $\frac{3}{2}$

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

C. 3)2

D. 4)3

Answer: B

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52. The degree and the order of the differential equation $\frac{d^2y}{dx^2} = \sqrt[3]{1 + \left(\frac{dy}{dx}\right)^2}$ respectively are

A. 1)2 and 3

B. 2)3 and 2

C. 3)2 and 2

D. 4)3 and 3

Answer: B

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53. The solution of the differential equation $x\frac{dy}{dx} - y = 3$ represents a family of

A. straight lines

B. Circles

C. Parabolas

D. Ellipses

Answer: A

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54. The integrating factor of $\frac{dy}{dx} + y = \frac{1+\mathrm{y}}{x}$ is

A. xe^x

B. $xe^{1/x}$

C. $\frac{e^x}{x}$

D. $\frac{x}{e^x}$

Answer: C

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55. If $\left|\vec{a} \times \vec{b}\right|^2 + \left|\vec{a} . \vec{b}\right|^2 = 144$ and $\left|\vec{a}\right| = 4$, then the value of $\left|\vec{b}\right|$ is

A. 1

B. 2

C. 3

D. 4

Answer: C

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56. If $\vec{a}$ and $\vec{b}$ are mutually perpendicular unit vectors , then $\left(3\vec{a}+2\vec{b}\right).\left(5\vec{a}-6\vec{b}\right)=$

A. 5

B. 3

C. 6

D. 12

Answer: B

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57. If the vectors $p\hat{i}+\hat{j}+\hat{k}, \hat{i}i+q\hat{j}+\hat{k}$ and $\hat{i}+\hat{j}+r\hat{k}(p \neq q \neq r \neq 1)$ are coplanar, then the value of pqr-$(p+q+r)$ is :

A. 2

B. -2

C. 0

D. -1

Answer: B

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58. If $\vec{a} = \hat{i} + \lambda\hat{j} + 2\hat{k}$, $\vec{b} = \mu\hat{i} + \hat{j} - \hat{k}$ are orthogonal and $\left|\vec{a}\right| = \left|\vec{b}\right|$, then (λ, μ)=

A. $\left(\frac{1}{4}, \frac{7}{4}\right)$

B. $\left(\frac{7}{4}, \frac{1}{4}\right)$

C. $\left(\frac{1}{4}, \frac{9}{4}\right)$

D. $\left(\frac{-1}{4}, \frac{9}{4}\right)$

Answer: A

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