MATHS

BOOKS - HIMALAYA MATHS

(KANNADA ENGLISH)

COMMON ENTRANCE TEST -2016

Question Bank

1. If 3 $\tan^{-1} x + \cot^{-1} x \equiv \pi$ then x equal to

A. $\min us1$

B. 0

C. 44228

D. 1

Answer: D

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2. Find the co-ordinates of the foot of the perpendicular drawn from the origin to the plane $5y + 8 = 0$

A. (8/25 , 0,0)

B. (0, - 8/2,2)

C. (0, -8/5,0)

D. (0, 8/5,0)

Answer: C

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3. If the straight lines $2x + 3y - 3 = 0$ and $x + ky + 7 = 0$ are perpendicular, then the value of k is

A. minus 2/3

B. 44257

C. minus 3/2

D. 44230

Answer: A

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4. Let $*$ be a binaray operation deifned on R by $a * b = \frac{a+b}{4} \forall$ a, b εR then the operation $*$ is

A. Associative but not commutative

B. Commutative and Associative

C. Neither Associative nor Commutative

D. Commutative but not Associative

Answer: D

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5. $\lim_{x \to 0} \frac{xe^x - \sin x}{x}$ is equal to

A. 0

B. 3

C. 2

D. 1

Answer: A

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6. The value of $\int \frac{e^{6\log x} - e^{5\log x}}{e^{4\log x} - e^{3\log x}} dx$ is equal to

A. $\frac{x^3}{3}$

B. $\frac{3}{x^3}$

C. 0

D. 1/x

Answer: A

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7. Integrating factor of $x\frac{dy}{dx} - y = x^4 - 3x$ is

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8. The length of latus rectum of parabola $4y^2 + 3x + 3y + 1 = 0$ is

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9. Two dice are thrown simultaneously, the probability of obtaining a total score of 5 is

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10. Area lying between the curves $y^2 - 2x$ and $y = x$ is

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11. If A is any aquare matrix of order 3×3 then $|3A|$ is equal to

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12. The solution for the differential equation $\frac{dy}{y} + \frac{dx}{x} = 0$ is

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13. IF x yz are not equal to $\neq 0, \neq 1$ the value of $\begin{vmatrix} \log x & \log y & \log z \\ \log 2x & \log 2y & \log 2z \\ \log 3x & \log 3y & \log 3z \end{vmatrix}$ is equal to

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14. 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 ?

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15. The set A has 4 element and the set B has 5 elements then the number of injective mappings that can be deifned from A to B is

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16. The two curves

$x^3 - 3xy^2 + 2 = 0$ and $3x^2y - y^3 = 2$

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17. Evaluate $\int \frac{e^x(1+x)}{\cos^2(xe^x)} dx$

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18. The simplified form of

$i^n + i^{n+1} + i^{n+2} + i^{n+3}$ is

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19. The value of $\int_2^8 \frac{\sqrt{10-x}}{\sqrt{x}+\sqrt{10-x}}dx$ is

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

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21. The coefficient of variation of two distribution are 60 and 70. The standard deviations are 21 and 16 respectively, then their mean is

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22. If x, y, z are all different and not equal to zero and

$$\begin{vmatrix} 1+x & 1 & 1 \\ 1 & 1+y & 1 \\ 1 & 1 & 1+z \end{vmatrix} = 0$$ then the value of $x^{-1}+y^{-1}+z^{-1}$ is equal to

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23. If $x = 2 + 3\cos\theta$ and $y = 1 - 3\sin\theta$ represent a circle then the centre and radius is

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

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25. If $\tan^{-1}\left(x^2+y^2\right)=\alpha$ then $\frac{dy}{dx}$ is equal to

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26. The vector equation of the plane which is at a distance of $3/\sqrt{14}$ from the origin and the normal from the origin is $2\hat{i}-3\hat{j}+\hat{k}$ is

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27. The equation of the normal to the curve $y(1+x^2)=2-x$ where the tangent crosses x - axis is

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28. Find the value of $\tan\frac{\pi}{8}$.

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29. The real part of $(1-\cos\theta+I\sin\theta)^{-1}$ is

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30. If $x^m y^n = (x+y)^{m+n}$ then $\frac{dy}{dx}$ is equal to

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31. The differential coefficient of $\log_{10} x$ with respect to $\log_x 10$ is

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32. $\int_0^{\pi/2} \frac{\sin^{1000} x dx}{\sin^{1000} x + \cos^{1000} x}$ is equal to

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33. The value of $f e^x \frac{x^2 \tan^{-1} x + \tan^{-1} x + 1}{x^2 + 1} dx$ is equal to

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34. The 11^{th} term in the expansion of $\left(x + \frac{1}{\sqrt{x}}\right)^{14}$ is

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35. The general solution of $\cot\theta + \tan\theta = 2$ is

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36. If $A = \begin{bmatrix} \cos 2thet & -\sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{bmatrix}$ and $A + A^T = 1$, where I is the unit matrix of 2×2 & A^T is the transpose of A. then the value of θ is equla to

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37. If A is matrix of order $m \times n$ and B is a matrix such that AB' and B'A are both defined, the order of the matrix B is

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38. The value of $1\sin^{-1}\left(\frac{\cos(53\pi)}{5}\right)$ is

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39. If $2\vec{a}.\vec{b} = |\vec{a}|.|\vec{b}|$ then the between $\vec{a}$ and $\vec{b}$ is

A. 90^o

B. 30^o

C. 60^o

D. 45^o

Answer: C

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40. If $1 + \sin\theta + \sin^2\theta + \ldots$ upto $\infty 2\sqrt{3} + 4$, then θ = _____

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41. The function $f(x) = [x]$ where $[x]$ is the greatest integer function is continous at

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42. Let $f: R \to R$ be defined by $f(x) = 2x + 6$ which is bijective mapping then $f^{-1}(x)$ is given by

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43. If $\cos\alpha, \cos\beta, \cos\gamma$ are the direction cosines fo a vector $\vec{a}$, then $\cos 2\alpha + \cos 2\beta + \cos 2\gamma$ is equal to

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44. Write the converse and contrapositive of the statement " If x is a prime number then x is odd "

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45. The value of $\int_{-\pi/4}^{\pi/4} \sin^{103} x \cdot \cos^{101} x dx$ is

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46. If a = 3,b = 4, c = 5 each one of $\vec{a}$, $\vec{b}$ and $\vec{c}$ is perpendicular to the sum of the remaining then $\left|\vec{a}+\vec{b}+\vec{c}\right|$ is equal to

A. $5\sqrt{2}$

B. $\sqrt{2}$

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

D. $\sqrt{5}$

Answer: A

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47. Suppose $\vec{a} + \vec{b} + \vec{c} = 0, \left|\vec{a}\right| = 3, \left|\vec{b}\right| = 5, \left|\vec{c}\right| = 7$, then the angle between $\vec{a}$ and $\vec{b}$ is

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

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

C. π

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

Answer: A

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48. If $x^y = e^{x-y}$ then $\frac{dy}{dx}$ is equal to

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49. If $P(A \cap B) = 7/10$ and $P(B) = 17/20$, where P stands for probability then $P(A \mid B)$ is equal to

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50. Find a value of "x"for which $x\left(\hat{i}+\hat{j}+\hat{k}\right)$ is a unit vector .

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51. If $y=e^{\sin^{-1}\left(t^2-1\right)}$ & $x=e^{\sec-1\left(\frac{1}{t^2-1}\right)}$ then $\frac{dy}{dx}$ is equal to

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52. 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 :

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53. The slope of the tangent to the curve $x = t^2 + 3t - 8, y = 2t^2 - 2t - 5$ at the point $(2, -1)$ is

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54. The rate of change of area of a circle with respect to its radius at r = 2 cms is

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55. IF $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ then $A^2 - 5A$ is equal to

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56. The value of the $\sin 1^\circ + \sin 2^\circ + \ldots + \sin 359^\circ$ is equal to

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57. The order and degree of the differential equation

$$\left[1 + \left(\frac{dy}{dx}\right)^2 + \sin\left(\frac{dy}{dx}\right)\right]^{3/4} = \frac{d^2y}{dx^2}$$

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58. $\tan^{-1}\left(\frac{x}{y}\right) - \tan^{-1}\left(\frac{x-y}{x+y}\right)$ is

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59. The sum of 1^{st} n terms of the series

$$\frac{1^2}{1} + \frac{1^2+2^2}{1+2} + \frac{1^2+2^2+3^2}{1+2+3} + ..$$

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60. Two cards are drawn at randrom from a pack of 52 cards. The probability of these two

being "Aces" is


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