MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

COMMON ENTRANCE TEST -2015

Question Bank

1. If α and β are the roots of $x^2 - ax + b^2 = 0$, then $\alpha^2 + \beta^2$ is equal to :

A. $a^2 - 2b^2$

B. $2a^2 - b^2$

C. $a^2 - b^2$

D. $a^2 + b^2$

Answer: A

Watch Video Solution

2. If the 2^{nd} and 5^{th} terms of G.P. are 24 and 3 respectively then the sum of 1^{st} six terms is :

A. 189/2

B. 189/5

C. 179/2

D. 2/189

Answer: A

Watch Video Solution

3. The middle term of expansion $\left(\frac{10}{x}+\frac{x}{10}\right)^{10}$ is

A. ${}^{7}C_{5}$

B. ${}^{8}C_{5}$

C. ${}^{9}C_{5}$

D. ${}^{10}C_{5}$

Answer: D

Watch Video Solution

4. If $\begin{vmatrix} 2a & x_1 & y_1 \\ 2b & x_2 & y_2 \\ 2c & x_3 & y_3 \end{vmatrix} = \frac{abc}{2} \neq 0$, then the area of the triangle whose vertices are $\left(\frac{x_1}{a}, \frac{y_1}{a}\right), \left(\frac{x_2}{b}, \frac{y_2}{b}\right)$ and $\left(\frac{x_3}{c}, \frac{y_3}{c}\right)$

A. 1/4 abc

B. 1/8 abc

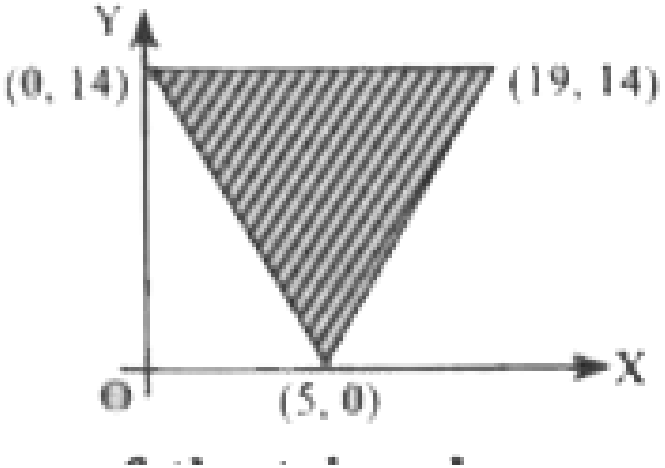
C. 44287

D. 44409

Answer: D

Watch Video Solution

5. The shaded region shown in fig. is given by the inequation



A. $14x + 5y \geq 70, y \leq 14$ and $x - y \leq 5$

B. $14x + 5y \geq 70, y \leq 14$ and $x - y \geq 5$

C. $14x + 5y \leq 70, y \leq 14$ and $x - y \geq 5$

D. $14x + 5y \geq 70, y \geq 14$ and $x - y \geq 5$

Answer: A

Watch Video Solution

6. $\sim[(\sim p) \wedge q]$ is logically equivalent to

A. $p \vee (\sim q)$

B. $p \wedge (\sim q)$

C. ~[p wedge (~q)]`

D. $\sim(p \vee q)$

Answer: B

Watch Video Solution

7. The value of $\sin^{-1}\left(\frac{2\sqrt{2}}{3}\right) + \sin^{-1}\left(\frac{1}{3}\right)$ is equal to

A. $\frac{\pi}{6}$

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

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

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

Answer: B

Watch Video Solution

8. If the ecentricity of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 is \frac{5}{4}$ and $2x + 3y - 6 = 0$ is focal chord of the hyperbola , then the length of tranverse axis is equal to _____.

A. 44328

B. 44340

C. 44322

D. 45413

Answer: B

Watch Video Solution

9. If $\vec{a} = \hat{i} + 2\hat{j} + 2\hat{k}, \left|\vec{b}\right| = 5$ and the angle between $\vec{a}$ and $\vec{b}$ is $\frac{\pi}{6}$, then the area of the triangle formed by these two vectors as two sides is

A. 44242

B. 15

C. 44301

D. $15\frac{\sqrt{3}}{2}$

Answer: C

Watch Video Solution

10. If $\vec{a} = i - 2j + 3k$, $\vec{b}$ is a vector such that $\vec{a} . \vec{b} = \left|\vec{b}\right|^2 \left|\vec{a} - \vec{b}\right| = \sqrt{7}$, then $\left|\vec{b}\right|$= _____

A. 7

B. 14

C. $\sqrt{7}$

D. 21

Answer: C

Watch Video Solution

11. If direction cosines of a vector of magnitude 3 are $\frac{2}{3}, -\frac{9}{3}, \frac{2}{3}$ and $a > 0$, then vector is _____

A. 2i + j +2k

B. 2i - j +2k

C. I - 2j + 2k

D. I + j + 2k

Answer: B

Watch Video Solution

12. Equation of line passing through the point (2,3,1) and parallel to the line of intersection of the plane $x - 2y - z + 5 = 0$ and $x + y + 3z = 6$ is

A. (x-2)/5 = (y-3)/-4 = (z-1)/3

B. (x-2)/-5 = (y-3)/-4 = (z-1)/3

C. (x-2)/5 = (y-3)/4 = (z-1)/3

D. (x-2)/4 = (y-3)/3 = (z-1)/2

Answer: B

Watch Video Solution

13. Foot of perpendicular drawn from the origin to the plane $2x - 3y + 4z = 29$ is _____

A. (5, -1, 4)

B. (2, -3, 4)

C. (7, -1, 3)

D. (5, -2,3)

Answer: B

Watch Video Solution

14. If two dice are thrown simultaneously , then the probability that the sum of the numbers which come up on the dice to be more than 5 is _____

A. 13271

B. 44348

C. 43221

D. 13/18

Answer: D

Watch Video Solution

15. If $y = f(x^2)$ and $f'(3) = 5$ then $\frac{dy}{dx}$ at x = 1 is _____

A. 5

B. 25

C. 15

D. 10

Answer: D

Watch Video Solution

16. If $x = a\cos^3\theta, y = a\sin^3\theta$, then $1 + \left(\frac{dy}{dx}\right)^2$ is_____

A. $\tan\theta$

B. $\tan^{\theta}$

C. $\sec^{\theta}$

D. 10

Answer: C

Watch Video Solution

17. Slope of normal to the curve $y = x^2 - \frac{1}{x^2}$ at $(-1, 0)$ is

A. 44287

B. minus 1/4

C. 4

D. minus 4

Answer: A

Watch Video Solution

18. $\int \frac{1}{x^2(x^4+1)^{3/4}} dx$ is equal to _____.

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

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

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

D. $-\frac{(1+x^4)^{\frac{3}{4}}}{x} + C$

Answer: A

Watch Video Solution

19. If $f: R \to R$ is defined by $f(x) = \frac{x}{x^2+1}$ find $f(f(2))$.

A. 47119

B. 47392

C. 44498

D. 29

Answer: B

Watch Video Solution

20. Evalute $\begin{vmatrix} \cos 15^\circ & \sin 15^\circ \\ \sin 75^\circ & \cos 75^\circ \end{vmatrix}$

A. 1

B. 0

C. 2

D. 3

Answer: B

Watch Video Solution

21. A man takes a step forward with probability 0.4 and one step backward with probability 0.6, then the probability that at the end of eleven steps he is one step away from the starting point is

A. $^{11}C_5 \times (0.48)^5$

B. $^{11}C_6 \times (0.24)^5$

C. $^{11}C_5 \times (0.12)^5$

D. $^{11}C_6 \times (0.72)^6$

Answer: B

Watch Video Solution

22. $\int_0^{\pi/4} \log\left(\frac{\sin x + \cos x}{\cos x}\right) dx$ is equal to

A. $\frac{\pi}{4}\log 2$

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

C. $\frac{\pi}{8}\log 2$

D. log 2

Answer: C

Watch Video Solution

23. Area bounded by $y = x^3$, $y = 8$ and $x = 0$ is _____.

A. 2 sq. units

B. 14 sq. units

C. 12 sq. uits

D. 6 sq. units

Answer: C

Watch Video Solution

24. Let $\vec{a} = \hat{i} + 2\hat{j} + \hat{k}$, $\vec{b} = \hat{i} - \hat{j} + \hat{k}$ and $\vec{c} = \hat{i} + \hat{j} - \hat{k}$, vector in the plane of $\vec{a}$ and $\vec{b}$ whose projection on $\vec{c}$ is $\frac{1}{\sqrt{3}}$ is _____.

A. 3i+j-3k

B. 4i+j-4k

C. i+j-2k

D. 4i-j+4k

Answer: D

Watch Video Solution

25. The mean devision from the data 3,10,10,4 ,7,10,5 is

A. 3

B. 2

C. 3.75

D. 2.57

Answer: D

Watch Video Solution

26. The probability distribution of X is : $\begin{cases} X: & 0 & 1 & 2 & 3 \\ P(X) & 0.2 & k & k & 2k \end{cases}$

find the value of k.

A. 0.2

B. 0.3

C. 0.4

D. 0.1

Answer: A

Watch Video Solution

27. If the function $g(x)$ is defined by

$g(x) = \frac{x^{200}}{200} + \frac{x^{199}}{199} + \frac{x^{198}}{198} + ... + \frac{x^2}{2} + x + 5,$ then $g'(0)$ =

_____.

A. 1

B. 200

C. 100

D. 5

Answer: A

Watch Video Solution

28. A box contains 6 red numbers from 1 through 6 and 4 white marbles 12 through 15 . Find the probability that a marble drawn 'at random ' is white and odd number :

A. 5

B. 44317

C. 6

D. 44348

Answer: B

Watch Video Solution

29. $\lim_{x \to 0} \frac{1 - \cos x}{x^2}$ is :

A. 2

B. 3

C. 44228

D. 44256

Answer: C

Watch Video Solution

30. $f(x) = \begin{cases} 3x - 8 & \text{If } x \leq 5 \\ 2k & \text{if} x > 5 \end{cases}$ is continuous, find k

A. 44379

B. 44380

C. 44381

D. 44234

Answer: D

Watch Video Solution

31. If $f(x) = 2x^2$, find $\frac{f(3.8) - f(4)}{3.8 - 4}$:

A. 1.56

B. 156

C. 15.6

D. 0.156

Answer: C

Watch Video Solution

32. If x = ct and y = $\frac{c}{t}$, find $\frac{dy}{dx}$ at t = 2 .

A. 44287

B. 4

C. minus 1/4

D. 0

Answer: C

Watch Video Solution

33. A balloon which always remains spherical is being inflated by pumping in 10 cubic centimeters of gas per second. Find the rate at which the radius of the balloon is increasing when the radius is 15cm.

A. $\frac{1}{90\pi}\frac{cm}{\sec}$

B. $\frac{1}{9\pi}\frac{cm}{\sec}$

C. $\frac{1}{30\pi}\frac{cm}{\sec}$

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

Answer: A

Watch Video Solution

34. $\int \frac{\sin^2 x}{1+\cos x}$ dx is equal to

A. x + sin x + C

B. x - sin x + C

C. sin x + C

D. cos x + c

Answer: B

Watch Video Solution

35. Evaluate : $\int e^x \left(\frac{1+\sin x}{1+\cos x} \right) dx$

A. $e^x \tan\left(\frac{x}{2}\right) + C$

B. tan(x/2)+C

C. $e^x + C$

D. `e^(x) sin x + C

Answer: A

Watch Video Solution

36. If $1, w, w^2$ are three cube roots of unity, then $\left(1 - w + w^2\right)\left(1 + w - w^2\right)$ is _____

A. 1

B. 2

C. 3

D. 4

Answer: D

Watch Video Solution

37. Solve for x $\tan^{-1}\left(\frac{1-x}{1+x}\right) = \frac{1}{2}\tan^{-1} x, x > 0$

A. $\sqrt{3}$

B. 1

C. minus 1

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

Answer: D

Watch Video Solution

38. The system of linear equations $x + y + z = 6, x + 2y + 3z = 10$ and $x + 2y + az = b$ has no solution when _____

A. $a = 2, b \neq 3$

B. `a = 3, b ne 10

C. b = 2, a = 3

D. $b = 3, a \neq 0$

Answer: B

Watch Video Solution

39. The value of $\tan(1^\circ) + \tan(89^\circ)$ is _____

A. $\frac{1}{\sin(1^o)}$

B. $\frac{2}{\sin(2^o)}$

C. $\frac{2}{\sin(1^o)}$

D. $\frac{1}{\sin(2^o)}$

Answer: B

Watch Video Solution

40. If $\frac{(x+1)^2}{x^3+x} = \frac{A}{x} + \frac{Bx+C}{x^2+1}$ then $\text{cosec}^{-1}\left(\frac{1}{A}\right) + \cot^{-1}\left(\frac{1}{B}\right) + \sec^{-1} C =$ _____

A. $\frac{5\pi}{6}$

B. 0

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

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

Answer: B

Watch Video Solution

41. The remainder obtained when $1! + 2! + 3! + ... + 11!$ is divided by 12 is_____

A. 9

B. 8

C. 7

D. 6

Answer: A

Watch Video Solution

42. If $\alpha \leq 2\sin^{-1}x + \cos^{-1}x \leq \beta$, then

A. $\alpha = -\frac{\pi}{2}, \beta = \frac{\pi}{2}$

B. $\alpha = -\frac{\pi}{2}, \beta = \frac{3\pi}{2}$

C. $\alpha = 0, \beta = \pi$

D. $\alpha = 0, \beta = 2\pi$

Answer: C

Watch Video Solution

43. If $A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$, then A^2 equal to_____

A. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 0 & 1 \\ 10 & 1 \end{bmatrix}$

Answer: C

Watch Video Solution

44. The function $f(x) = [x]$, where [x] denotes greatest integer function is continuous at _____

A. 4

B. minus 2

C. 1

D. 1.5

Answer: D

Watch Video Solution

45. If $y = \log\left(\frac{1-x^2}{1+x^2}\right)$, then $\frac{dy}{dx}$ is equal to _____

A. $\frac{-4x}{1-x^4}$

B. $\frac{4x^3}{1-x^4}$

C. $\frac{1}{4-x^4}$

D. $\frac{-4x^3}{1-x^4}$

Answer: A

Watch Video Solution

46. The two curves $x^3 - 3xy^2 + 2 = 0$ and $3x^2y - y^3 = 2$

A. touch each other

B. cut at right angle

C. $cutat\angle\frac{\pi}{3}$

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

Answer: B

Watch Video Solution

47. If x is real, the minimum value of $x^2 - 8x + 17$ is :

A. 1

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

48. $\int_{-\pi/4}^{\pi/4} \frac{dx}{1+\cos 2x}$ is equal to

A. 2

B. 1

C. 4

D. 0

Answer: B

Watch Video Solution

49. The order of differential equation of all circles of given radius 'a' is _____

A. 4

B. 2

C. 1

D. 3

Answer: B

Watch Video Solution

50. Find the general solution of the differential equation $x\frac{dy}{dx} + 2y = x^2(x \neq 0)$

A. $y = \frac{x^2 + C}{4x^2}$

B. $y = \frac{x^2}{4} + C$

C. $y = \frac{x^4 + C}{x^2}$

D. $y = \frac{x^4 + C}{4x^2}$

Answer: D

Watch Video Solution

51. If $\sin x + \sin y = \frac{1}{2}$ and $\cos x + \cos y = 1$, then $\tan(x + y)$ =_____

A. 44263

B. minus 3/4

C. minus 8/3

D. 44259

Answer: D

Watch Video Solution

52. If $A = \begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$ and $|A^3| = 27$, then α= _____

A. ± 1

B. ± 2

C. $\pm\sqrt{7}$

D. $\pm\sqrt{5}$

Answer: C

Watch Video Solution

53. If $P = \begin{vmatrix} x & 1 \\ 1 & x \end{vmatrix}$ and $Q = \begin{vmatrix} x & 1 & 1 \\ 1 & x & 1 \\ 1 & 1 & x \end{vmatrix}$ then $\frac{dQ}{dx}$ = _____

A. 3P+1

B. 1-3P

C. minus 3P

D. 3P

Answer: D

Watch Video Solution

54. A line passes through (2,2) and is perpendicular to the line $3x + y = 3$, its y-intercepts is_____

A. 44256

B. 44257

C. 44259

D. 1

Answer: C

Watch Video Solution

55. Let $f: R \to R$ be defined by $f(x) = \frac{1}{x} \forall x \in R$, then f is

_____

A. one-one

B. onto

C. bijective

D. f is not defined

Answer: D

Watch Video Solution

56. The solution set of the equation $\frac{x^2+6x-7}{|x+4|}<0$ is _____

A. (-7,1)

B. (-7,-4)

C. $(-7,-4)\cup(-4,1)$

D. `(-7,-4) cup (4,1)

Answer: C

Watch Video Solution

57.

$f(x) = \frac{1}{2} - \tan\left(\frac{\pi x}{2}\right) - 1 < x < 1$ and $g(x) = \sqrt{(3 + 4x - 4x^2)}$

. Find domain of $(f + g)$

A. [(-1)/2,1]

B. ((-1)/2,1]

C. [-1/2,3/2]

D. (-1,1)

Answer: A

Watch Video Solution

58. Write the set builder form $A = \{-1, 1\}$

A. A = {x : x is a real number}

B. A = {x :x is a interger}

C. $A = \{x : xisa\sqrt[0]{f}theequationx^2 = 1\}$

D. $A = \{x : xisa\sqrt[0]{f}theequationx^2 + 1 = 0\}$

Answer: C

Watch Video Solution

59. If the operation $\oplus$ is defined by $a \oplus b = a^2 + b^2$ for all real numbers 'a' and 'b' then $(2 \oplus 3) \oplus 4$ = _____

A. 181

B. 182

C. 184

D. 185

Answer: D

Watch Video Solution

60. If $Z = \frac{\left(\sqrt{3}+1\right)^3 (3i+4)^2}{(8+6i)^2}$ then |Z| is equal to

A. 0

B. 1

C. 2

D. 3

Answer: C

Watch Video Solution