MATHS

BOOKS - IPUCET PREVIOUS YEAR PAPERS

MATHS (HINGLISH)

GGSIPU MATHEMATICS 2010

Mcqs

1. If $|z_1 - 1| < 1, |z_2 - 2| < 2, |z_3 - 3| < 3$, then

$|z_1 + z_2 + z_3|$

A. is less than 6

B. is more than 3

C. is less than 12

D. lies between 6 and 12

Answer:

Watch Video Solution

2. If z_1 and z_2 are two complex numbers such that $|z_1| = |z_2| + |z_1 - z_2|$ then

A. $\text{Im}\frac{z_1}{z_2} = 0$

B. $\text{Re}\frac{z_1}{z_2} = 0$

C. $\text{Re}\frac{z_1}{z_2} = Im\frac{z_1}{z_2}$

D. none of the above

Answer:

Watch Video Solution

3. The largest term common to the sequences $1, 11, 21, 31, \rightarrow 100$ terms and $31, 36, 41, 46, \rightarrow 100$ terms is 381 b. 471 c. 281 d. none of these

A. 381

B. 471

C. 281

D. none of these

Answer:

Watch Video Solution

4. If the roots of $a_1x^2 + b_1x + c_1 = 0$ are α_1, β_1 and those of $a_2x^2 + b_2x + c_2 = 0$ are α_2, β_2 such that $\alpha_1\alpha_2 = \beta_1\beta_2 = 1$ then

A. $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

B. $\frac{a_1}{c_2} = \frac{b_1}{b_2} = \frac{c_1}{a_2}$

C. $a_1 a_2 = b_1 b_2 = c_1 c_2$

D. none of the above

Answer:

Watch Video Solution

5. The number of real roots of $(x+3)^4 + (x+5)^4 = 16$

A. 0

B. 2

C. 4

D. none of the above

Answer:

6. The number of six digit numbers that can be formed from the digits $1, 2, 3, 4, 5, 6 \& 7$ so that digits do not repeat and terminal digits are even is:

A. 144

B. 72

C. 288

D. 720

Answer:

7. The system of equations $x+2y+3z=4$, $2x+3y+4z=5, 3x+4y+5z=6$ has

A. many solution

B. no solution

C. unique solution

D. none of the above

Answer:

Watch Video Solution

8. A skew symmetric matrix S satisfies the relations $S^2 + 1 = 0$ where I is a unit matrix then SS' is equal to

A. I

B. 2I

C. $-I$

D. none of the above

Answer: A

Watch Video Solution

9. A die is loaded so that the probability of a face i is proportional to $i, i = 1, 2, 6$. Then find the probability of an even number occurring when the die in rolled.

A. $\frac{7}{4}$

B. $\frac{4}{7}$

C. $\frac{5}{7}$

D. none of the above

Answer:

Watch Video Solution

10. if $\tan^{-1}\left\{\frac{\sqrt{1+x^2}-\sqrt{1-x^2}}{\sqrt{1+x^2}+\sqrt{1-x^2}}\right\}=\alpha$ then x^2 is:

A. sin 2 α

B. $\sin 2\alpha$

C. $\cos 2\alpha$

D. $\cos \alpha$

Answer:

Watch Video Solution

11.

$$\tan\left(\frac{\pi}{4}+\frac{1}{2}\cos^{-1}\frac{a}{b}\right)+\tan\left(\frac{\pi}{4}-\frac{1}{2}\cos^{-1}\frac{a}{b}\right)$$

is :

A. $\frac{2a}{b}$

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

C. $\frac{b}{a}$

D. $\frac{2b}{a}$

Answer:

Watch Video Solution

12. In a $\triangle ABC$, A :B:C= 3:5:4. Then $a+b+c\sqrt{2}$ is equal to

A. 2b

B. 2c

C. 3b

D. 3a

Answer:

Watch Video Solution

13. The set of values of x for which $\frac{\tan 3x - \tan 2x}{1 + \tan 3x \tan 2x} = 1$ is

A. ϕ

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

C. $\left\{n\pi + \frac{\pi}{4}, n = 1, 2, 3. .\right\}$

D. $\left\{2n\pi + \frac{\pi}{4}, n = 1, 2, 3. .\right\}$

Answer:

Watch Video Solution

14. Which of the two 3x-4y+4=0 and 3x-3y+12=0 is nearer to origin

A. 4x-3y+12=0

B. 3x-3y+12=0

C. 3x-4y+4=0

D. none of the above

Answer:

Watch Video Solution

15. If the equal sides AB and AC (each equal to 5 units) of a right-angled isosceles triangle ABC are produced to P and Q such that $BP \cdot CQ = AB^2$, then the line PQ always passes through the fixed point (where A is the origin and AB, AC lie along the positive x and positive y - axis respectively)

A. a,0

B. 0,a

C. a,a

D. none of the above

Answer:

Watch Video Solution

16. A variable circule having fixed radius 'a' passes through origin and meets the co-ordinate axes in point A and B. Locus of centroid of triangle OAB where 'O' being the origin, is -

A. $9x^2 + y^2 = 4a^2$

B. $9x^2 + y^2 = a^2$

C. $9x^2 + y^2 = 2a^2$

D. $9x^2 + y^2 = 8a^2$

Answer:

Watch Video Solution

17. Find the condition that the straight line $cx - by + b^2 = 0$ may touch the circle $x^2 + y^2 = ax + by.$

A. $abc = 1$

B. $a = c$

C. $b = ac$

D. none of these

Answer:

Watch Video Solution

18. If two circles $(x-1)^2 + (y-3)^2 = r^2$ and $x^2 + y^2 - 8x + 2y + 8 = 0$ intersect in two distinct points , then

A. $2 < r < 8$

B. $r < 2$

C. r=2

D. $r > 2$

Answer:

Watch Video Solution

19. Find the number of distinct normals that can be drawn from $(-2, 1)$ to the parabola $y^2 - 4x - 2y - 3 = 0$

A. 1

B. 2

C. 3

D. 0

Answer:

Watch Video Solution

20. If parabolas $y^2 = \lambda x$ and $25\left[(x-3)^2 + (y+2)^2\right] = (3x - 4y - 2)^2$ are equal, then the value of λ is 9 (b) 3 (c) 7 (d) 6

A. 1

B. 2

C. 3

D. 6

Answer:

Watch Video Solution

21. The eccentricity of an ellipse whose pair of a conjugate diameter are $y = x$ and $3y = -2x$ is (A) $\frac{2}{3}$ (B) $\frac{1}{3}$ (C) $\frac{1}{\sqrt{3}}$ (D) none

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

B. $\frac{1}{3}$

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

D. none of the above

Answer:

Watch Video Solution

22. If the foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{b^2} = 1$ and the hyperbola $\frac{x^2}{144} - \frac{y^2}{81} = \frac{1}{25}$ coincide write the value of b^2.

A. 18

B. -16

C. 16

D. -18

Answer:

Watch Video Solution

23. The number of vectors of unit length perpendicular to the vectors $\hat{a} = \hat{i} + \hat{j}$ and $\overrightarrow{b} = \hat{j} + \hat{k}$ is

A. -1

B. 2

C. 4

D. ∞

Answer:

Watch Video Solution

24. If $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{b} = 4\hat{i} + 3\hat{j} + 4\hat{k}$ and $\vec{c} = \hat{i} + \alpha\hat{j} + \beta\hat{k}$ are linearly dependent vectors and $\left|\vec{c}\right| = \sqrt{3}$ then

A. $\alpha = 1, \beta = -1$

B. $\alpha = 1, \beta = \pm 1$

C. $\alpha = \pm 1, \beta = \pm 1$

D. $\alpha = \pm 1, \beta = 1$

Answer:

Watch Video Solution

25. Let the pairs $\left|\hat{i}\right|\hat{b}\Big|$ and $\left|\hat{c}, \hat{d}\right|$ each determines a plane then the planes are paralle if

A. $\hat{i} \times \hat{c}x\hat{b} \times \hat{d} = \hat{0}$

B. $\hat{i} \times \hat{b}.\hat{c} \times \hat{d} = \hat{0}$

C. $\hat{i} \times \hat{c}x\hat{b} \times \hat{d} = \hat{0}$

D. $\hat{i} \times \hat{c}.\hat{b} \times \hat{d} = \hat{0}$

Answer:

Watch Video Solution

26. The equation of the plane perpendicular to the yz plnae and passing through the point 1,-24 and 3,-4,5 is

A. y+2z=5

B. 2y+z=5

C. y+2z=6

D. 2y+z=6

Answer:

Watch Video Solution

27. If the planes $\hat{r}.2\hat{i}+\gamma\hat{j}-3\hat{k}=0$ and $\hat{r}.\gamma\hat{i}+3\hat{j}+\hat{k}$=5 are perpendicular then γ is equal to

A. 2

B. -2

C. 3/5

D. -3

Answer:

Watch Video Solution

28. The sine of the angle between the straight line $\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-4}{5}$ and the plane $2x-2y+z=5$ is

A. $\frac{10}{6\sqrt{5}}$

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

C. $\frac{\sqrt{2}}{10}$

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

Answer:

Watch Video Solution

29. If

$y = \cos^{-1}\sqrt{\frac{\sqrt{1+x^2}+1}{2\sqrt{1+x^2}}}, then\frac{dy}{dx}isequa < o$

$\frac{1}{2(1+x^2)}, x \in R$ (b) $\frac{1}{2(1+x^2)}, x > 0$

$\frac{-1}{2(1+x^2)}, x < 0$ (d) $\frac{1}{2(1+x^2)}, x < 0$

A. $\frac{1}{1+x^2}$

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

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

D. none of the above

Answer:

Watch Video Solution

30. The value of $\lim_{x \to \infty} \left[\sqrt{x+\sqrt{x+\sqrt{x}}} - \sqrt{x}\right]$ is

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

B. 1

C. 0

D. none of the above

Answer:

Watch Video Solution

31. The values of a,b and c which make the function

$$f(x) = \begin{cases} \frac{\sin(a+1)x + \sin x}{x} & x < 0 \\ C & x = 0 \\ \frac{\sqrt{x+bx^2} - \sqrt{x}}{bx^{3/2}} & x > 0 \end{cases}$$

continuous at $x = 0$ are

A. $a = -\frac{3}{2}, c = \frac{1}{2}, b = 0$

B. $a = \frac{3}{2}, c = \frac{1}{2}, b \neq 0$

C. $a = -\frac{3}{2}, c = \frac{1}{2}, b \neq 0$

D. none of the above

Answer:

Watch Video Solution

32. If the slope of the curve $y = \frac{ax}{b - x}$ at the point (1, 1) is 2, then

A. $1, -2$

B. $-1, 2$

C. $1, 2$

D. none of the above

Answer:

Watch Video Solution

33. Find area bounded by the curve $\sqrt{x} + \sqrt{y} = \sqrt{a}$ & coordinate axes.

A. 2a

B. a

C. $2\sqrt{2a}$

D. none of the above

Answer:

Watch Video Solution

34. The function $f(x) = \frac{\sin x}{x}$ is decreasing in the interval

A. $\left(\frac{-\pi}{2}, 0\right)$

B. $\left(\frac{\pi}{2}, 0\right)$

C. $\left(\frac{-\pi}{4}, 0\right)$

D. none of the above

Answer:

Watch Video Solution

35. The set of points where the function $f(x) = |x-2|\cos x$ is differentiable is

A. $-\infty, \infty$

B. $-\infty, \infty - \{2\}$

C. $0, \infty$

D. none of the above

Answer:

Watch Video Solution

36. The domain of the function $f(x) = \sin^{-1}\left\{(\log)_2 \frac{x^2}{2}\right\}$ is given by__

A. $[-2, -1]\mu[1, 2]$

B. $[-2, -1]\mu[1, 2]$

C. $-2, -1]\mu[1, 2]$

D. $-2, -1\mu 1, 2$

Answer:

Watch Video Solution

37. If f is an even function and g is an odd function then the function fog is

A. an even function

B. an odd function

C. neither even nor odd

D. a periodic funtion

Answer: A

Watch Video Solution

38. integrate of $\sec^n$ x tan x dx is equal to

A. $\frac{\sec^n x}{n} + c$

B. $\frac{\sec^2 x}{n} + c$

C. $\frac{\tan x}{n} + c$

D. $\frac{\sec^n x \tan x}{n} + c$

Answer:

Watch Video Solution

39. Evalaute $\int_{\pi/6}^{\pi/3} \frac{\sqrt{(\sin x)}dx}{\sqrt{(\sin x)} + \sqrt{(\cos x)}}$

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

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

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

D. none of the above

Answer:

Watch Video Solution

40. The area enclosed by $|x| + |y| = 1$ is

A. 2 sq unit

B. 3 sq unit

C. $\frac{1}{2}$ sq unit

D. $\bar{2}$ sq unit

Answer:

Watch Video Solution

41. The constraints

$-x_1 + x_2 < 1, \ -x_1 + 3x_2 \leq 9, x_1, x_2 > , 0$

difines on

A. bounded feasible space

B. unbounded feasible space

C. both bounded and unbounded feasible space

D. none of the above

Answer:

Watch Video Solution

42. If a variate takes values $a, ar, ar^2, . . ar^{n-1}$ which of the relation between means hold

A. $AH = G^2$

B. $\frac{A+H}{2} = G$

C. $A > G > H$

D. $A = G = H$

Answer:

Watch Video Solution

43. If for $n = 4$ the approximate value of integral $\int_1^9 x^2 dx$ by trapezoidal is $2\left[\left(\frac{1}{2}\right)(1 + 9^2) + \alpha^2 + \beta^2 + 7^2\right]$ then

A. $\alpha = 1, \beta = 3$

B. $\alpha = 2, \beta = 4$

C. $\alpha = 3, \beta = 5$

D. $\alpha = 4, \beta = 6$

Answer:

Watch Video Solution

44.

$2\cos\left(\frac{\pi}{13}\right)\cos\left(9\frac{\pi}{13}\right) + \cos\left(3\frac{\pi}{13}\right) + \cos\left(5\frac{\pi}{13}\right) = 0$

A. 2

B. 0

C. 1

D. 3

Answer:

Watch Video Solution

45. If the angles of elevation of the top of a tower from two points at distances a and b from the base and in the same straight line with it are complementary then the height of the tower is

A. $\frac{a+b}{a-b}$

B. $\frac{a-b}{a+b}$

C. $\frac{(a-b)b}{a+b}$

D. $\frac{a-b}{(a+b)b}$

Answer:

Watch Video Solution

46. The probability that out of 10 person, all born in June, at least two have the same birthday is

A. $\frac{3c_{10}}{30^{10}}$

B. $-\frac{3c_{10}}{30}$

C. $\frac{30^{10}-3c_{10}}{30^{10}}$

D. none of the above

Answer:

Watch Video Solution

47. There are n person sitting in a row two of them are selected at random the probability that two selected persons are not together is

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

B. $1-\frac{2}{n}$

C. $\frac{n(n-1)}{(n+1)(n+2)}$

D. none of the above

Answer: B

Watch Video Solution