MATHS

BOOKS - OSWAAL PUBLICATION MATHS (KANNADA ENGLISH)

II PUC TOPPER'S ANSWERS MARCH (2017)

Part A Answer All The Ten Questions

1. Let * be a binary operation on N given by a*b =1cm of a and b find the value of 20*16

Watch Video Solution

2. What is the principle value of $\text{cosec}^{-1}\left(-\sqrt{2}\right)$?

Watch Video Solution

3. Construct a 2×2 matrix, $A = \left[a_{ij}\right]$, whose elements are given by $a_{ij} = \frac{i}{j}$

Watch Video Solution

4. If a square matrix with $|A| = 8$ then find the value of |A A'|`.

Watch Video Solution

5. If y=cos $\sqrt{x}$, find $\frac{dy}{dx}$

Watch Video Solution

6. $\int\left(\sqrt{x}+\frac{1}{\sqrt{x}}\right)dx$

Watch Video Solution

7. Define collinear vectors.

Watch Video Solution

8. Find the direction cosines of a line which makes equal angles with the coordinate axes.

Watch Video Solution

9. Define feasible region in a linear programming Problem.

Watch Video Solution

10. If A and B are independent events, $P(A)\frac{3}{5}$ and $P(B) = \frac{1}{5}$ then find $P(A \cap B)$.

Watch Video Solution

Part B Answer Any Ten Questions

1. If $f: R \to R$, defined by $F(x) = 1 + x^2$, then show that f is neither 1 - 1 nor onto.

Watch Video Solution

2. Prove that $\sin^{-1}\left(2 \times \sqrt{1 - x^2}\right) = 2\cos^{-1} x, \frac{1}{\sqrt{2}} \leq x \leq 1$

Watch Video Solution

3. If $\tan^{-1}\left(\frac{1-x}{1+x}\right) = \frac{1}{2}\tan^{-1} x, x > 0$, then x = ?

Watch Video Solution

4. Find the values of k if area of tringle is 4 sq. units and dvertices are :

(i) (k,0), (4,0), (0,2)

(ii) (-2,0), (0,4), (0,k)

Watch Video Solution

5. $ax + by^2 = \cos y$

Watch Video Solution

6. Verify Rolles theorem for the function $f(x) = x^2 + 2x - 8, x \in [-4, 2]$.

Watch Video Solution

7. Find the approximate change in the valume of a cube of side x metres caused side by 3%.

Watch Video Solution

8. Intergrate $\frac{\tan^4 \sqrt{x} \sec^2 \sqrt{x}}{\sqrt{x}}$ with respect to x.

Watch Video Solution

9. The value of $\int_0^{2/3} \frac{dx}{4+9x^2}$ is equal to

Watch Video Solution

10. what is the order of the differential equation $\left(\frac{dy}{dx}\right)^2 + \frac{dy}{dx} - \sin^2 y = 0$?

Watch Video Solution

11. Find the position vector of a point R which divides the line joining two points P and Q whose position vectors are $\hat{i} + 2\hat{j} - \hat{k}$ and $-\hat{i} + \hat{j} + \hat{k}$ respectively, in the ratio 2 : 1(i) internally (ii) externally

Watch Video Solution

12. Find the position vector of a point R which divides the line joining two points P and Q whose position vectors are $\hat{i}+2\hat{j}-\hat{k}$ and $-\hat{i}+\hat{j}+\hat{k}$ respectively, in the ratio 2 : 1(i) internally (ii) externally

Watch Video Solution

13. Find the area of the parallelogram whose adjacent sides are determined by the vectors $\overrightarrow{a}=\hat{i}-\hat{j}+3\hat{k}$ and $\overrightarrow{b}=2\hat{i}-7\hat{j}+\hat{k}$.

Watch Video Solution

14. Find the vector and the cartesian equations of the line that passes through the points $(3, 2, 5), (3, 2, 6)$.

Watch Video Solution

15. Find the probability distribution of (i) number of heads in two tosses of a coin. (ii) number of tails in the simultaneous tosses of three corns. (iii) number of heads in four tosses of a com.

Watch Video Solution

Part C Answer Any Ten Questions

1. Show that the relation R on R defined as $R = \{(a, b) : a \leq b\}$, is reflexive and transitive but not symmetric.

Watch Video Solution

2. Write $\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right), x \neq 0$ in the simplest form.

Watch Video Solution

3. If A and B are symmetric matrices of the same order.then show that AB is symmetric if and only if AB=BA.

Watch Video Solution

4. Differentiate $(\log x)^{\cos x}$ with respect to x.

Watch Video Solution

5. Differentiate $\sin^2 x$ with respect to $e^{\cos x}$

Watch Video Solution

6. Find two positive numbers x and y such that $x + y = 60$and $xy^3$is maximum.

Watch Video Solution

7. $\int \frac{2x}{x^2+3x+2} dx$

Watch Video Solution

8. $\int e^x \sin x dx$

Watch Video Solution

9. Area (in square units) of the region bounded by the curve $y^2 = 4x$, y-axis and the line $y = 3$, is

Watch Video Solution

10. Form the differential equation of the family of circles having centre on y-axis and radius 3 units.

Watch Video Solution

11. Find λ for which the points $A(3,\ 2,\ 1),\ B(4,\ \lambda,\ 5),\ C(4,\ 2,\ -2)\ and\ D(6,\ 5,\ -1)$ are coplanar.

Watch Video Solution

12. Three vectors $\vec{a}, \vec{b}$ and $\vec{c}$ satisfy the condition $\vec{a} + \vec{b} + \vec{c} = \vec{0}$ .Evaluate the quantity

$\mu = \vec{a} . \vec{b} + \vec{b} . \vec{c} + \vec{c} . \vec{a}$,if $\left|\vec{a}\right| = 1, \left|\vec{b}\right| = 4$ and $\left|\vec{c}\right| = 2$

Watch Video Solution

13. Find the shortest distance between the lines $\vec{r} = \left(\hat{i} + 2\hat{j} + \hat{k}\right) + \lambda\left(\hat{i} - \hat{j} + \hat{k}\right)$ and $\vec{r} = \left(2\hat{i} - \hat{j} - \hat{k}\right) + \mu\left(2\hat{i} + \hat{j} + 2\hat{k}\right)$

Watch Video Solution

14. Given that the two number appearing on throwing two dice are different. Find the probability of the event the sum of numbers on the dice is 4.

Watch Video Solution

Part D Answer Any Six Questions

1. Let $f: N \to R$be a function defined as $f(x) = 4x^2 + 12x + 15$. Show that $f: N \to S$, where, S is the range of f, is invertible. Find the inverse of f.

Watch Video Solution

2. If $A = [102021203]$, prove that $A^3 - 6A^2 + 7A + 2I = 0$

Watch Video Solution

3. Solve the following system of linear equation by matrix method.

$x - y + 2z = 1$

$2y - 3z = 1$

and $3x - 2y + 4z = 2$.

Watch Video Solution

4. If $y = \left(\tan^{-1} x\right)^2$, show that $\left(x^2 + 1\right)^2 y_2 + 2x\left(x^2 + 1\right) y_1 = 2$

Watch Video Solution

5. The length x of a rectangle is decreasing at the rate of 5 cm/minute and the width y is increasing at the rate of 4 cm/minute. When x = 8cm and y = 6cm, find the rates of change of (a) the perimeter, and (b) the area of the rectangle

Watch Video Solution

6. The length x of a rectangle is decreasing at the rate of 5 cm/minute and the width y is increasing at the rate of 4 cm/minute. When x = 8cm and y = 6cm, find the rates of change of (a) the perimeter, and (b) the area of the rectangle

Watch Video Solution

7. $\int \sqrt{x^2 - 8x + 7} dx =$

Watch Video Solution

8. Using integration find the area of the triangular region whose sides have the equations $y = 2x + 1$, $y = 3x + 1$ and $x = 4$.

Watch Video Solution

9. solve the differential equation $\cos^2 x \frac{dy}{dx} + y = \tan x \left(0 \leq x < \frac{\pi}{2}\right)$.

Watch Video Solution

10. Derive the equation of a plane perpendicular to a given vector and passing through a given point in both vector form and Cartesian form.

Watch Video Solution

11. The probability that a bulb produced by a factory will fuse after 150 days of use is 0.05. Find the probability that out of 5 such bulbs (i) none (ii) not more than one (iii) more than one (iv) at least one will fuse after 150 days of use.

Watch Video Solution

Part E Answer Any One Question

1. Prove that $\int_{o}^{a} f\backslash\ (x)\backslash\, dx = \backslash\ \int_{o}^{a} f\backslash\ (a-x)dx\cdot$

Watch Video Solution

2.

$$\begin{bmatrix} x & x^2 & yz \\ y & y^2 & zx \\ z & z^2 & xy \end{bmatrix} = (x-y)(y-z)(z-x)(xy+yz+zx)$$

Watch Video Solution

3. Minimize and Maximize $z = 600x + 400y$

Subject to the constraints :

$x + 2y \leq 12$

$2x + y \leq 12$

$4x + 5y \geq 21$ and $x \geq 0, y \geq 0$ graphical method.

Watch Video Solution

4. For what value of k, function $f(x) = \begin{cases} \frac{k\cos x}{\pi - 2x}, & \text{if } x \neq \frac{\pi}{2} \\ 3, & \text{if } x = \frac{\pi}{2} \end{cases}$ is continuous at $x = \frac{\pi}{2}$?

Watch Video Solution