

PAPER - I : MODEL PAPER - 04

(BASED ON MARCH 2016)

MATHEMATICS & STATISTICS

COMMERCE

TIME : 1 HR 30 MIN

MARKS : 40

NOTES : 1. All questions are compulsory

2. Answers to section I and section II must be written in separate ans. Books

3. Graph paper is compulsory for L.P.P.

4. Logarithm table will be provided on demand

5. Figures to the right indicate full marks

6. Answers to every question must be written on new page

ALL THE BEST

Q1. (A) Attempt any six of the following

(12)

01. Find $\frac{dy}{dx}$ if $y = (\sin x)^x$

02. if $A = \begin{bmatrix} 1 & 3 \\ 3 & 1 \end{bmatrix}$ Show that : $A^2 - 2A$ is a scalar matrix

03. Write negations of the following statements

1. $\forall n \in \mathbb{N}, n + 7 > 8$

2. If it snows then Gajashri does not drive the car

04. For manufacturing x units, price of each unit is $p = 10800 - 4x^2$. Find the values of x for which revenue is increasing

05. Evaluate : $\int \frac{\sec x \cdot \tan x}{\sec^2 x + 4} dx$

06. Find $\frac{dy}{dx}$ if $y = \sin^{-1}(\cos 3x)$

07. $f(x) = \frac{\sqrt{x+3} - 2}{x^3 - 1}$; $x \neq 1$

$= 5$; $x = 1$ Discuss continuity at $x = 1$

08. State which of the following sentences are statements . In case of statement , write down the truth value
- a) Every quadratic equation has only real roots
- b) $\sqrt{-4}$ is a rational number

Q2. (A) Attempt any TWO of the following

(06)

01. Solve the following equations by the inversion method

$$2x + 3y = -5 \quad \text{and} \quad 3x + y = 3$$

02 .

$$\left\{ 2 \begin{pmatrix} 5 & 0 & -1 \\ 1 & 2 & -3 \end{pmatrix} - 3 \begin{pmatrix} 2 & -1 & 1 \\ -4 & 2 & 3 \end{pmatrix} \right\} \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix}$$

Find x and y

03. Evaluate : $\int \cot^{-1}x \, dx$

(B) Attempt any TWO of the following

(08)

01. a) Express the truth of each of the following statements using Venn Diagram

1. All Sundays are holidays and holidays are Sundays
2. if a quadrilateral is a square then it is a parallelogram

- b) Write converse and inverse of the following statement

'If function is differentiable then it is continuous'

02. Find the volume of the solid obtained by the complete revolution of the ellipse

$$\frac{x^2}{36} + \frac{y^2}{25} = 1 \quad \text{about } y - \text{axis}$$

Q3. (A) Attempt any TWO of the following

(06)

01. find a & b if f(x) is continuous at x = 0

$$f(x) = \frac{e^{2x} - 1}{ax} \quad ; \quad x < 0, a \neq 0$$

$$= 1 \quad ; \quad x = 0$$

$$= \frac{\log(1 + 7x)}{bx} \quad ; \quad x > 0, b \neq 0$$

02. $f(x) = \frac{\sin^2 x}{1 - \cos^3 x} \quad ; \quad x \neq 0$
 $= \frac{3}{2} \quad ; \quad x = 0$ Discuss continuity at $x = 0$

03. if $f'(x) = 4x^3 - 3x^2 + 2x + k$ and $f(0) = 1$, $f(1) = 4$. Find $f(x)$

(B) Attempt any TWO of the following

(08)

01. Discuss the extreme values of $f(x) = x \cdot \log x$

02. in a firm the cost function for output x is given as $C = \frac{x^3}{3} - 20x^2 + 70x$

Find the output for which Marginal cost is minimum

03. $\log \left(\frac{x^4 - y^4}{x^4 + y^4} \right) = k$ Show that : $\frac{dy}{dx} = \frac{y}{x}$

DO NOT STOP
GET READY FOR NEXT