

PAPER - I : MODEL PAPER - 02

(BASED ON OCT – 2014)

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. Write the following statements in symbolic form

a) ABC is a triangle hence the points A, B & C are not collinear

b) It is not true that Subhash passed , then he is happy

02 $A = \begin{pmatrix} 1 & 2 \\ 3 & 2 \\ -1 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 3 & 2 \\ 4 & -1 & -3 \end{pmatrix}$ Show that : AB is singular matrix

03. if $A = \begin{pmatrix} 7 & 1 \\ 2 & 5 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 2 \\ 3 & -1 \end{pmatrix}$; Verify : $|AB| = |A| \cdot |B|$

04. Discuss continuity of the function at the given point . If the function is discontinuous then remove the discontinuity

$$f(x) = \frac{\tan^2 7x}{x^2} ; x \neq 0$$
$$= 49 ; x = 0$$

05. Find the value of x for which the function is decreasing

$$f(x) = 4x^3 - 12x^2 - 36x + 1$$

06. Differentiate : $\tan^{-1} (\cot 2x)$ wrt x

07. $f(x) = \frac{\sqrt{4+x} - 2}{3x} ; x \neq 0$
 $= \frac{1}{4} ; x = 0$ Discuss continuity at $x = 0$

08. Evaluate : $\int e^x \frac{x+1}{(x+2)^2} dx$

Q2. (A) Attempt any TWO of the following

(06)

01. Without using the truth table , show that $\sim (p \vee q) \vee (\sim p \wedge q) \equiv \sim p$

02. $y = \tan^{-1} \left(\frac{1 - \cos x}{\sin x} \right)$. Find dy/dx

03. Evaluate $\int \frac{\tan x}{\sec x + \tan x} dx$

(B) Attempt any TWO of the following

(08)

01. find a & b if f(x) is continuous at $x = 0$ & $f(1) = 2$ where ;

$f(x) = x^2 + a ; x \geq 0$
 $= 2\sqrt{x^2 + 1} + b ; x < 0$

02. the total cost function for producing a good x is given by

$$C = \frac{x^2}{4} + 7x + 100$$

where x is the output . Find the output of the good for which the average cost is minimum and the minimum average cost . Verify that at this output $AC = MC$

03. Find the area of the ellipse : $\frac{x^2}{4} + \frac{y^2}{9} = 1$

HOMework

Q3. (A) Attempt any TWO of the following

(06)

01. Examine whether the statement $(p \wedge \sim q) \leftrightarrow (p \rightarrow q)$ is a tautology or contradiction or neither of them

02. Find $\frac{dy}{dx}$; if $x = \tan^{-1} \theta$; $y = \theta^3$

03. Evaluate : $\int \frac{1}{x^2 - 10x - 39} dx$

(B) Attempt any TWO of the following

(08)

01. Express the following equations in matrix form and solve them by method of inversion

$$x - y + z = 4 \quad ; \quad 2x + y - 3z = 0 \quad ; \quad x + y + z = 2$$

02. The expenditure E_c of a person with income x is given by

$$E_c = 0.0006x^2 + 0.003x$$

Find the marginal propensity to consume & marginal propensity to save when $x = 200$.

Also find the average propensity to consume and average propensity to save.

03. Evaluate : $\int_{\pi/5}^{3\pi/10} \frac{1}{1 + \sqrt{\tan x}} dx$

DO NOT STOP
GET READY FOR NEXT