

# PAPER - I : MODEL PAPER - 05

(BASED ON MARCH 2017)

**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  $x, y, z, w$  if 
$$\begin{pmatrix} x+y & x-y \\ y+z+w & 2w-z \end{pmatrix} = \begin{pmatrix} 2 & -1 \\ 9 & 5 \end{pmatrix}$$

02. Express the truth of the following statements with the help of Venn Diagrams

a) there are politicians who are not actors

b) there are actors who are not politicians

03. Find points of discontinuity, if any for the function  $f(x) = \frac{x^2 - 9}{\sin x - 9}$

04. Write negations of the following statements

a) Kiran is rich if and only if he is honest

b) if  $x \in A \cap B$ , then  $x \in A$  and  $x \in B$

05. Evaluate :  $\int \tan^2 4x \, dx$

06. Find  $\frac{d^2y}{dx^2}$  if  $y = \log x$

07. Evaluate :  $\int \frac{10x^9 + 10^x \log 10}{x^{10} + 10^x} \, dx$

08. Find  $\frac{dy}{dx}$ , if  $x^3 + y^2 + xy = 10$

**Q2. (A) Attempt any TWO of the following****(06)**

01.  $\begin{pmatrix} 1 & 2 & 3 \\ -1 & 1 & 2 \\ 1 & 2 & 4 \end{pmatrix}$  Find inverse of the matrix by ADJOINT METHOD

02.  $f(x) = \frac{x^7 - 128}{x^5 - 32} ; x \neq 2$   
 $= k ; x = 2$  Find k if f is continuous at  $x = 2$

03. If the demand function is  $D = \frac{p+6}{p-3}$  ; find elasticity of demand at  $p = 4$

**(B) Attempt any TWO of the following****(08)**

01. Using truth table verify that :  $(p \vee q) \rightarrow r \equiv (p \rightarrow r) \wedge (q \rightarrow r)$

02. If Mr. Rao orders x cupboards , with demand function as  $p = 2x + \frac{32}{x^2} - \frac{5}{x}$   
How many cupboards should he order for the most economical deal

03.  $\int_0^1 \frac{x \cdot (\sin^{-1} x)^2}{\sqrt{1-x^2}} dx$

**Q3. (A) Attempt any TWO of the following****(06)**

01. Solve the following equations by reduction method  
 $x + 3y + 3z = 16 ; x + 4y + 4z = 21 ; x + 3y + 4z = 19$

02.  $f(x) = x^2 \cdot \sin\left(\frac{1}{x}\right) ; x \neq 0$   
 $= 1 ; x = 0$  Discuss continuity at  $x = 0$

03. Find the values of x for which :  $f(x) = 4x^3 - 12x^2 - 36x + 1$  is decreasing

**(B) Attempt any TWO of the following****(08)**

01. Find the area of the region bounded by parabola  $y^2 = 16x$  and the line  $x = 4$

02. if  $x^3 \cdot y^5 = (x + y)^8$ , then show that  $\frac{dy}{dx} = \frac{y}{x}$

03. Evaluate  $\int \frac{1 + \log x}{x(2 + \log x)(3 + \log x)} dx$

---

DO NOT STOP  
GET READY FOR NEXT