PAPER – I : MODEL PAPER – 01

(BASED ON MARCH 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. $A = \begin{pmatrix} 8 & 0 \\ 4 & -2 \\ 3 & 6 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & -2 \\ 4 & 2 \\ -5 & 1 \end{pmatrix}$ Find matrix X such that $X = 2A + 3B$

02. if the function f is continuous at $x = 2$, then find $f(2)$

$$f(x) = \frac{x^3 - 8}{x^2 - x - 2} \; ; \; x \neq 2$$

03. $x = \tan^{-1}\theta$; $y = \theta^3$; find $\frac{dy}{dx}$

04. Evaluate : $\int \sin^2 3x \; dx$

05. Write negations of the following statements

(a) policeman is honest and he is not rich

(b) $\exists\, n \in N$, such that $n + 4 > 9$

06. $A = \begin{pmatrix} 7 & 1 \\ 2 & 5 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 2 \\ 3 & -1 \end{pmatrix}$; Find $|AB|$

07. Evaluate $\int \frac{1}{16 - 9x^2} \; dx$

08. $f(x) = x^2 + 1 \quad ; \quad x < 0$

$= 5\sqrt{x^2 + 1} + k \quad ; \quad x \geq 0$ find k if the f is continuous at x = 0

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

01. If $x^y = e^x$; show that $\frac{dy}{dx} = \frac{\log x - 1}{(\log x)^2}$

02. if $\sin y = x.\sin(5 + y)$; prove that $\frac{dy}{dx} = \frac{\sin^2(5 + y)}{\sin 5}$

03. Discuss the extreme values of the function $f(x) = x.e^x$

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

01. Discuss the continuity of the function f at x = 0

where $f(x) = \frac{e^x + e^{-x} - 2}{\cos 2x - \cos 6x} \quad ; \quad x \neq 0$

$= \frac{1}{16} \quad ; \quad x = 0$

02. The expenditure Ec of a person with income I is given by

$E_c = 0.00002\ I^2 + 0.008\ I$

Find marginal propensity to consume (MPC) and average propensity to consume (APC) when I = 8000

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

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

01. if p : Dhanashri is beautiful

q : Dhanashri is intelligent

Give the verbal statements for the following symbolic statements

a) $p \wedge \sim q$ b) $p \vee q$ c) $p \leftrightarrow q$

02. Using the truth table , examine whether the statement pattern

$$(p \wedge q) \rightarrow (p \vee \sim q)$$

is a tautology , a contradiction or a contingency

03. The total cost for production of Q items is given $C = Q^3 - 600Q^2 + 1200Q$. Find the values of Q for which average cost is decreasing

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

01. $A = \begin{pmatrix} 3 & 2 & 6 \\ 1 & 1 & 2 \\ 2 & 2 & 5 \end{pmatrix}$. Find A^{-1} by using elementary transformation

02. Evaluate : $\int_0^2 \frac{dx}{x + \sqrt{4 - x^2}}$

03. Find the volume of a solid obtained by the complete revolution of the ellipse

$$\frac{x^2}{25} + \frac{y^2}{36} = 1$$

about X – axis

DO NOT STOP

GET READY FOR NEXT