

PAPER - II : MODEL PAPER - 04

(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

Q4. Attempt any six of the following

(12)

01. If the numerator of the fraction is increased by 20% and its denominator be diminished by 10% , the value of the fraction is $\frac{16}{21}$. Find the original fraction

02. in a complete life table $l_4 = 60$ and $L_4 = 45$. Find the value of p_4

03. If the present worth of a bill due six months hence is ₹ 2,500 at 10% p.a. , what is the sum due

04. The following data give the marks of 20 students in Mathematics (X) and Statistic (Y) each out of 10 , expressed as (x,y) . Construct ungrouped frequency distribution
(2,7) ; (3,8) ; (4,9) ; (2,8) ; (2,8) ; (5,6) ; (5,7) ; (4,9) ; (3,8) ; (4,8) ; (2,9) ;
(3,8) ; (4,8) ; (5,6) ; (4,7) ; (4,7) ; (4,6) ; (5,6) ; (5,7) ; (4,6)

05. A college book store is given 15% trade discount & 5% cash discount by publisher . Find the total amount of discount if the store purchases books worth ₹ 8,000 , according to the price list from the publisher

06. The time (in minutes) for a lab assistant to prepare the equipment for a certain experiment is a random variable taking values between 25 and 35 minutes with pdf

$$f(x) = \frac{1}{10} \quad ; \quad 25 < x < 35$$
$$= 0 \quad ; \quad \text{otherwise}$$

What is the probability that preparation time exceeds 33 minutes

07. Solve the following minimal assignment problem

Machines	Jobs		
	I	II	III
M ₁	1	4	5
M ₂	4	2	7
M ₃	7	8	3

08. If X has Poisson Distribution with variance 2, find $P(X = 4)$ (Given : $e^{-2} = 0.1353$)

Q5. (A) Attempt any TWO of the following (06)

01. Find the number of years for which an annuity of ₹ 200 is paid at the end of each year, if its accumulated amount works out to be ₹ 662 with interest compounded at 10% p.a.

02. Complete the following life table

x	l _x	d _x	q _x	p _x	L _x
4	9100	60	?	?	?
5	?	45	?	?	

03. find number of pair of observations from the following data
 $r = 0.5$; $\sum xy = 120$; $SD_y = 8$; $\sum x^2 = 90$; where x and y are deviations from their respective means

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

01. find k if following is a pdf of r.v. X

$$f(x) = \begin{cases} kx(1-x) & ; \quad 0 < x < 1 \\ 0 & ; \quad \text{otherwise} \end{cases} \quad \text{Also find } P(1/4 < X < 1/2)$$

02. Solve the following LPP graphically

$$\text{Minimize } z = 30x + 20y$$

$$\text{subject to : } x + y \leq 8 ; 6x + 4y \geq 12 , 5x + 8y \geq 20 ; x, y \geq 0$$

03. Solve the MINIMAL ASSIGNMENT PROBLEM

		Topics				
		Linear Prog.	Queuing Theory	Dynamic Prog.	Regression Analysis	
Professors	A	2	10	9	7	TIME IN HRS
	B	15	4	14	8	
	C	13	14	16	11	
	D	4	15	13	9	

Q6. (A) Attempt any TWO of the following**(06)**

01. Find e_0^0 ; e_1^0 ; e_2^0

Age x	0	1	2
I_x	1000	900	700
T_x	---	---	11500

02. Two series of X and Y with 50 items each have standard deviations 4.5 and 3.5 respectively . If the sum of product of deviations of X and Y series from respective arithmetic means is 420 then find the correlation coefficient between X and Y
03. the equations of the regression lines are $2x + 3y - 6 = 0$ and $5x + 7y - 12 = 0$
Find a) correlation coefficient b) σ_x/σ_y

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

01. P and Q started a business with capitals in the ratio 4 : 3 . After 9 months P withdrew 25% of his capital and Q put in an equal amount in addition to his earlier capital . If at the end of the year P's share in the profit was ₹ 15,450 , find the total profit and Q's share of profit
02. A departmental store gives training to the salesmen in service followed by test . It is experienced that the performance regarding sales of any salesman is linearly related to the scores scored by him . The following data gives the test scores and the sales made by 9 salesmen during a fixed period

Test Scores (X)	16	22	28	24	29	25	16	23	24
Sales (Y) (in 00's)	35	42	57	40	54	51	34	47	45

- a) Obtain the line of regression of Y on X
b) Estimate Y when X = 17
03. pmf for the random variable X is defined as

$$p(x) = k.x \quad ; \quad x = 1, 2, 3$$
$$= 0 \quad ; \quad \text{otherwise}$$

Find the mean and variance of X

DO NOT STOP
GET READY FOR NEXT