

PAPER - II : 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

Q4. Attempt any six of the following

(12)

- 01.** Oliver spends 30% of his income on food items and 15% on conveyance . If in the particular month he spent ₹ 1800 on conveyance , find his expenditure on food items during the same month
- 02.** a building worth ₹ 5,00,000 is insured for $\frac{4}{5}$ of its value at a premium of 5% . What is the amount of premium .

03.

Age of wives (in yrs)	Age of Husbands (in yrs)			
	20 – 30	30 – 40	40 – 50	50 – 60
15 – 25	5	9	3	–
25 – 35	–	10	25	2
35 – 45	–	1	12	2
45 – 55	–	–	4	16
55 – 65	–	–	–	4

Find conditional distribution of age of husbands when age of wives lies in 25 – 35

- 04.** For a bivariate data : $\bar{x} = 53$; $\bar{y} = 28$; $b_{yx} = -1.5$; $b_{xy} = -0.2$
Estimate y when x = 50
- 05.** Values of two regression coefficients between the variables X and Y are $b_{yx} = -0.6$ and $b_{xy} = -0.3$ respectively . Obtain the value of correlation coefficient

06. Verify whether the following function can be regarded as probability mass function (p.m.f.) f for the given values of X

$X = x$	- 2	-1	1	2
$P(X = x)$	0.5	-0.1	0.6	0

07. let the pmf of a random variable X be

$$P(x) = \frac{3-x}{10} \quad ; \quad x = -1, 0, 1, 2$$

$$= 0 \quad ; \quad \text{otherwise} \quad \text{Calculate } E(x)$$

08. The time (in hours) required to perform the printing and binding operations (in that order) for each book is given in the following table :

Books	:	I	II	III	IV	V
Printing Machine M_1	:	3	7	4	5	7
Binding Machine M_2	:	6	2	7	3	4

Find the sequence to minimize the total elapsed time (in hours) to complete the work

Q5. (A) Attempt any TWO of the following

(06)

01. Find the present value of annuity immediate of ₹ 20,000 per annum for 3 years at 10% p.a. compounded annually ($1.1^{-3} = 0.7513$)
02. The coefficient of rank correlation for a certain group of data is 0.5 . If $\sum d^2 = 42$, assuming no ranks are repeated ; find the no. of pairs of observation
03. Ranking of 8 trainees at the beginning (X) and at the end (Y) of a certain course are given below

Trainees	:	A	B	C	D	E	F	G	H
X	:	1	2	4	5	6	8	3	7
Y	:	2	4	3	7	8	1	5	6

Find rank correlation

(B) Attempt any TWO of the following

(08)

01. Calculate the quantities indicated by '?' for the following part of a life table

x	l_x	d_x	q_x	p_x	L_x	T_x	e_x^0
70	5000	?	?	?	?	50000	?
71	4800	?	?	?	?	?	?
72	4400						

- 02.** Calculate CDR for town I and town II and comment on the results

Age Group (Years)	Town I		Town II	
	Population	No. of Deaths	Population	No. of Deaths
0 – 10	1500	45	6000	150
10 – 25	5000	30	6000	40
25 – 45	3000	15	5000	20
45 & above	500	22	3000	54

- 03.** A card is drawn at random and replaced four times from a well shuffled pack of 52 cards . Find the probability that

a) two diamond cards are drawn b) at least one diamond card is drawn

Q6. (A) Attempt any TWO of the following

(06)

- 01.** Mr. Ahuja and Mr. Sinha started a business with a capital investment of ₹ 75,000 and ₹ 50,000 respectively . After 5 months Mr. Ahuja put in ₹ 5,000 more as capital , while Mr. Sinha withdrew ₹ 10,000 from his existing capital . At the end of the year the profit was ₹ 11,720 . Find the share of each in the profit .

- 02.** A bill of ₹ 21,900 drawn on July 10 for 6 months was discounted for ₹ 21,720 at 5% p.a. On which day the bill was discounted

- 03.** Let X be the number of matches played by the player and Y be the number of matches in which he scored more than 50 runs . The following data shown is for 5 players

No of Matches Played X : 21 25 26 24 19

Scored more than 50 Y : 19 20 24 21 16

Find the regression line of X on Y

(B) Attempt any TWO of the following

(08)

- 01.** Find the sequence that minimizes total elapsed time (in hours) required to complete the following jobs on two machines M_1 and M_2 in the order M_1M_2 . Also find the minimum elapsed time and idle time for two machines

Job	A	B	C	D	E
M_1	6	2	10	4	11
M_2	3	7	8	9	5

02. Solve the following LPP: Minimize $z = 3x_1 + 2x_2$
subject to : $5x_1 + x_2 \geq 10$
 $2x_1 + 2x_2 \geq 12$
 $x_1 + 4x_2 \geq 12$
 $x_1, x_2 \geq 0$

03. Solve the following LPP: Maximize : $z = 4x + 10y$
subject to : $2x + 5y \leq 10$
 $5x + 3y \leq 15$
 $x \geq 0 ; y \geq 0$

DO NOT STOP
GET READY FOR NEXT