

PAPER - II : MODEL PAPER - 02

(BASED ON MARCH 2015)

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.** The ratio of number of boys and girls in a school is 3 : 2 . If 20 % of the boys and 30% of the girls are scholarship holders , find the percentage of students who are not scholarship holders

- 02.** Calculate CDR for city A and city B and compare

Age Group (Years)	Population A		Population B	
	Population in'000	No. of Deaths	Population in'000	No. of Deaths
0 – 15	10	200	14	320
15 – 60	30	300	44	490
60 & above	20	400	21	462

- 03.** The coefficient of rank correlation between marks in two subjects obtained by a group of students is – 0.5 . If the sum of the squares of the difference in ranks is 126 , find the number of students in the group
- 04.** a salesman receives 4% commission on the sales upto ₹ 10,000 and 5% commission on sales over ₹10,000 . Find his total income on the sale of ₹ 35,000
- 05.** find the present worth of ₹ 2,320 due 4 years hence at 4% p.a. simple interest . Find the true discount

06. Compute Age – Specific Death rate for the following data

Age Group	Population In '000	No. of deaths
0 – 10	11	240
10 – 20	12	150
20 – 60	9	125
60 & above	2	90

07. The bivariate frequency distribution of weight (kg) and height of 60 students of SYJC as follows

Weight (in kg)	Height (in cm)			
	100 – 109	110 – 119	120 – 129	130 – 139
40 – 44	9	6	–	3
45 – 49	6	3	3	1
50 – 54	–	6	3	3
55 – 59	3	4	7	3

Find conditional distribution of weight when height lies between 110 – 119

08. for a Binomial Distribution mean = $7/4$ & sd = $\sqrt{21/4}$. Find n and p

Q5. (A) Attempt any TWO of the following

(06)

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	3	7	4	5	7
M_2	6	2	7	3	4

02. A and B are partners in the company having capitals in the ratio 5 : 6 and the profits received by them are in the ratio 5 : 4. If B invested the capital in the company for 20 months, determine the period of A's investment
03. From a lot of 25 bulbs of which 5 are defective a sample of 5 bulbs was drawn at random with replacement. Find the probability that the sample will contain
- a) exactly 1 defective bulb b) at least 1 defective bulb

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

01. for the given following data , write the entries in the columns dx , qx , px , Lx of the life table where notations have their usual meaning

x :	60	61	62	63	64	65
l_x :	2000	1500	1000	540	120	0

02. from the following data about the sales and expenditure of a firm

	Sales (crores)	exp.(crores)	
	X	Y	
Mean	40	6	
S.D	10	1.5	correlation coefficient = 0.9

Obtain regression lines to

- a) estimate sales for a proposed adv. exp. of ₹ 10 crores
- b) estimate adv. exp. for proposed sales target of ₹ 60 crore

03. daily requirement of two vitamins V_1 , V_2 and the mineral M for a certain person is at least 30 units of V_1 ; 60 units of V_2 but not more than 40 units of M . He meets this requirement by taking two brands of tablets A and B

Tablet A has 3 units of V_1 , 4 units of V_2 and 1 unit of M

Tablet B has 1 unit of V_1 , 3 units of V_2 and 2 units of M

Tablet A costs ₹ 2 and B costs ₹ 1

Formulate this problem as LPP in order to determine the quantities of A & B he should take to minimize expenditure

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

01. The equations given of the two regression lines are

$$2x - y - 15 = 0 \quad \& \quad 3x - 4y + 25 = 0 \quad \text{Find Correlation coefficient}$$

03. The number of complaints which a bank manager receives per day is a Poisson random variable with parameter $m = 4$. Find the probability that the manager will receive at most two complaints on any given day $(e^{-4} = 0.0183)$

03. Find graphical solution for the following system of linear in equations

$$2x + 3y \geq 12 \quad ; \quad -x + y \leq 3 \quad ; \quad x \leq 4 \quad ; \quad y \geq 3$$

(B) Attempt any TWO of the following

(08)

01. the value of godown of ₹ 40,000 contains stock worth ₹ 2,40,000 . They were insured for ₹ 25,000 and 80% of the stock respectively . Due to fire , stock worth ₹ 30,000 was completely destroyed while remaining was reduced to 60% of its value . The damage to the godown was ₹ 20,000 . What sum can be claimed under the policy

02. X : 6 2 10 4 8
 Y : 9 11 5 8 7

Calculate correlation coefficient

03. A job production unit has four jobs A , B , C , D which can be manufactured on each of the four machines P , Q , R and S . The processing cost of each job is given in the following table

Jobs	Machines			
	P	Q	R	S
	Processing Cost (₹)			
A	31	25	33	29
B	25	24	23	21
C	19	21	23	40
D	38	36	34	40

How should the jobs be assigned to the four machines so that the total processing cost is minimum .

DO NOT STOP
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