

PAPER - II : MODEL PAPER - 06

(SPECIMEN PAPER)

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. Mr Mathew insures his property of 1,00,000 with three insurance companies X , Y and Z for 60,000 , 40,000 and 20,000 respectively . Fire breaks out and causes a loss of 80,000 Calculate the amount that can be claimed from X

02. if the total population under study is 45,000 and age SDR for the age group (60 and above) is 25 , find CDR and the values of x and y

Age Group	Population	No. of deaths
0 – 30	4000	100
30 – 60	x	150
60&above	y	650

03. on an average A can solve 40% of the problems . What is the probability of A solving 4 problems out of 6

04. Amar , akbar and Anthony started a transport business by investing 1,00,000 each . Amar left after 5 months from the commencement of the business and Akbar left 3 months later . At the end of the year , the business realized a profit of 37,500 . Find the Akbar's share of profit

05. the income of the broker remained unchanged though the rate of commission increased from 6% to 7.5%. Find the percentage reduction in the value of the business

06. Divija wants to invest at most ₹ 15,000 in Savings Certificates and Fixed Deposits . She wants to invest at least ₹ 3,000 in Savings Certificates and at least ₹ 5,000 in Fixed Deposits . The rate of interest on Saving Certificate is 8% p.a. and that on Fixed Deposit is 10% p.a. FORMULATE the above problem as LPP to determine maximum yearly income .

07. the pdf of continuous random variable X is given by

$$f(x) = \frac{x^2}{18} \quad ; \quad -3 < x < 3$$

$$= 0 \quad ; \quad \text{otherwise Find } P(|X| < 1)$$

08. The average number of misprints per page of a book is 1.5 . Assuming the distribution of the number of misprints to be Poisson , find the probability that a particular page of a book is free from misprints

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

01. Obtain the expected value and variance of a random variable X for the following probability distribution

x	-2	-1	0	1	2	3
P(X = x)	0.1	k	0.2	2k	0.3	k

02. Construct bivariate frequency table for income(X) and expenditure (Y)of 25 families given below taking intervals 200 – 300 ; 300 – 400 ; for X & Y

(250,200) ; (300,280) ; (325,300) ; (400,300) ; (450,280)
 (325,310) ; (450,325) ; (275,200) ; (355,245) ; (425,375)
 (475,400) ; (410,300) ; (280,225) ; (300,250) ; (425,400)
 (365,300) ; (270,200) ; (310,210) ; (375,200) ; (345,310)
 (290,210) ; (270,215) ; (300,210) ; (425,375) ; (470,380)

Find a) conditional freq. dist. of X when Y is between 200 – 300
 b) conditional freq. dist. of Y when X is between 400 – 500

03. Calculate the Spearman's rank Correlation coefficient between the following marks given by two judges to 8 contestants in the election elocution

Marks by A : 81 72 60 33 29 11 56 42
 Marks by B : 75 56 42 15 30 20 60 80

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

01. A bill of a certain amount drawn on 28th February 2007 for 8 months was cashed on 26th March 2007 for 5,496 at 14% p.a . Find the face value of the bill

02. $n = 25$, $\sum x = 125$, $\sum x^2 = 650$; $\sum y = 100$, $\sum y^2 = 460$, $\sum xy = 508$
 It was however discovered two pairs (6,14) and (8,6) were incorrect while correct pairs were (8,12) and (6,8) . Obtain correct value of correlation coefficient

03.	x	l_x	d_x	q_x	p_x	L_x	T_x	e_x^0
	20	88230	?	?	?	?	?	?
	21	79473	-	-	-	-	3205552	?

Notations have the usual meaning . Complete the table .

Q6. (A) Attempt any TWO of the following

(06)

01. for a group of 30 couples the regression line of age of wife (y) on the age of husband (x) is given as $3y - 4x + 60 = 0$. Ratio of variance of x to variance of y is 9:25 and the mean age of wife is 40 years , find the correlation coefficient and the mean age of husbands

02. Find solution set of the in equation $\frac{x + 4}{2x - 1} \geq 3$. Represent it on the number line

03. a team of 4 horses and 4 riders has entered the jumping show contest . The number of penalty points to be expected when each rider rides horse is shown below . How should the horses be assigned to the riders so as to minimize the expected loss . Also find the minimum expected loss

		HORSES			
		H1	H2	H3	H4
RIDERS	R1	12	3	3	2
	R2	1	11	4	13
	R3	11	10	6	11
	R3	5	8	1	7

(B) Attempt any TWO of the following

(08)

01. Two samples from bivariate populations have 15 observations each . The sample means of X and Y are 25 and 18 respectively . The corresponding sum of squares of deviations from means are 136 and 148 . The sum of product of deviations from respective means is 122 . Obtain the equation of line of regression of X on Y

02. Find mean and variance of the continuous random variable X whose p.d.f. is given by

$$f(x) = 6x(1 - x) \quad ; \quad 0 < x < 1$$

$$= 0 \quad ; \quad \text{otherwise}$$

03. Find the sequence that minimizes total elapsed time (in hours) required to complete the following jobs on three machines M_1 , M_2 and M_3 in the order $M_1M_2M_3$. Also find the minimum elapsed time and idle time for all three machines

Job	A	B	C	D	E
M_1	5	7	6	9	5
M_2	2	1	4	5	3
M_3	3	7	5	6	7

**DO NOT STOP
GET READY FOR NEXT**