

# PAPER - II : MODEL PAPER - 07

(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. The ratio of prices of two cycles was 16:23 . Two years later when the price of first cycle has increased by 10% and that of second by ₹ 477 ; the ratio of prices becomes 11 : 20 . Find the original prices of two cycles
02. for an immediate annuity paid for 3 years with interest compounded at 10% p.a. its present value is ₹ 10,000 . What is the accumulated value after 3 years (  $1.1^3 = 1.331$  )
03. the probability of defective bolts in a workshop is 40% . Find the mean and variance of defective bolts out os 10 bolts
04. a cargo of rice is insured at 5/8% to cover 80% its value . The premium paid is ₹ 5,250 . If the rice is worth ₹ 21 per kilo , how many kilos of rice did the cargo contain
05. the pdf of continuous random variable X is given by
$$f(x) = 2x \quad ; \quad 0 \leq x \leq 1$$
$$= 0 \quad ; \quad \text{otherwise} \quad \text{Find } P(1/3 < X < 1/2)$$
06. an agent was paid ₹ 58,500 as commission on the sale of computers at the rate of 12.5% . If the price of each computer was ₹ 18,000 , how many computers did he sell
07.  $P(x) = \frac{x-1}{3} \quad ; \quad x = 1, 2, 3$ 
$$= 0 \quad ; \quad \text{otherwise} \quad \text{Verify whether the function is a p.m.f.}$$
08. if  $X \sim N(4, 25)$  ; then find  $P(x \leq 4)$

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

01. John and Mathew started a business with their capitals in the ratio 8 :5 . After 8 months , John added 25% of his earlier capital as further investment . At the same time Mathew withdrew 20% of his earlier capital . At the end of the year , they earned ₹ 52000 as profit . Find their share of profit

02.

Age x	0	1	2
lx	1000	880	876
Tx	.....	.....	3323

Calculate  $e_0^0, e_1^0, e_2^0$

03. in a town,10 accidents take place in a span of 50 days. Assuming that the number of accidents follow Poisson Distribution , find the probability that there will be one or more accidents per day ( $e^{-0.2} = 0.8187$ )

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

01. if the difference between true discount and bankers discount on a sum due 4 months hence is ₹ 20 , find true discount , bankers discount and the amount of the bill , the rate of simple interest charged being 5% p.a.

02 X : 21 25 26 24 19  
 Y : 19 20 24 21 16 . Obtain regression line X on Y  
 (NOTE : keep bxy correct to 2 decimal places )

03. Determine the optimal sequence involving 5 jobs and three machines  $M_1, M_2$  and  $M_3$  . The jobs are processed on three machines in the order  $M_1M_2M_3$  . Also find the minimum total elapsed time T and idle time for three machines . Processing time in minutes are

Job	J1	J2	J3	J4	J5
M1	7	12	11	9	8
M2	8	9	5	6	7
M3	11	13	9	10	14

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

01. a train traveled between 2 stations The distance and the time were recorded as below

<b>Distance (km)</b>	80	120	160	200	240
<b>Time (Hr)</b>	2	3	4	5	6

02. for 20 pairs of observations on two variables x and y , the following data is available  
 $\Sigma(x-10) = 60 ; \Sigma(y-15) = 80 ; \Sigma(x-10)^2 = 990 ; \Sigma(y-15)^2 = 960 , \Sigma(x-10)(y-15) = 480$   
 Find the correlation coefficient between x and y

- 03.** The probability that a bomb dropped from an aeroplane will strike a target is  $1/5$ . If four bombs are dropped, find the probability that
- a) exactly two will strike the target                      b) at least one will strike the target

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

**(08)**

- 01.** Find the rank correlation coefficient for the following data

X : 68    64    75    50    64    80    75    40    55    64

Y : 62    58    68    45    81    60    68    48    50    70    ans : 0.545

- 02.** Find k if the function f defined by

$$f(x) = kx \quad ; \quad 0 < x < 2$$

$$= 0 \quad ; \quad \text{otherwise is a p.d.f. of a random variable X}$$

Also find  $P(1/4 < x < 1/3)$

- 03.** A production unit makes special type of metal chips by combining copper and brass. The standard weight of the chip must be at least 5 gm. The basic ingredients copper and brass cost ₹ 8 and ₹ 5 per gm. The durability considerations dictate that the metal chip must not contain more than 4 gm of brass and should contain minimum 2 gm of copper. Find the minimum cost of the metal chip satisfying the above conditions