PAPER – II : MODEL PAPER – 08

MATHEMATICS & STATISTICS

COMMERCE

TIME :   1 HR 30 MIN   MARKS : 40

ALL THE BEST

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

Q4.   Attempt any six of the following   (12)

01.   Oliver spends 30% of his income on food items and 15% on conveyance . If he spent ₹ 1800 on conveyance , find his expenditure on food items during the same month

02.   an annuity immediate is to be paid for certain number of years at 12% p.a. Its present value is ₹ 5000 and the accumulated value is ₹ 10,000 . Find the amount of each annuity payment

03.   A person holding a life policy of ₹ 60,000 for a term of 25 years wishes to discontinue after paying premium for 8 years at the rate of ₹ 58 per thousand per annum . What paid up value will he get on the policy

04.   a certain sum due 3 months hence is 21/20 of the present worth . What is the rate of interest

05.   coefficient of correlation between variables X and Y is 0.3 and their covariance is 12 . The variance of X is 9 . Find standard deviation of Y

06.

Age Group	No. of persons	Deaths
0 – 10	600	18
10 – 25	1000	5
25 – 65	3000	24
65 & above	400	20

Compute Age specific death rate

07 .   Bring out the fallacy if any in the following statement

"the mean of the binomial dist. is 15 and standard deviation 5"

08. Three person X , Y and Z started a business in partnership by investing ₹ 24,000 , ₹ 52,000 and ₹ 80,000 respectively . At the end of the year they Y earned a profit of ₹ 2,600 in the business . Find the X's share of profit

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

01. $r = 0.8$, $\Sigma x_i y_i = 60$, $\sigma y = 2.5$, $\Sigma x_i^2 = 90$, where x_i and y_i are the deviations from the respective means . Find the number of pair of observations

02. in binomial distribution with five independent trials , probabilities of one and two successes are 0.4096 and 0.2048 respectively . Find the probability of success

03. stocks in shop and godown costing ₹ 50,000 and ₹ 1,00,000 respectively were insured through an agent who was paid 12% of the total premium . If the former was insured for 80% and the later for 60% of the value , find the agents commission when the rate of premium was 80 paise percent less 20%

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

01. income of Mr Shah , Mr Patel and Mr Mehta are in the ratio 1 : 2 : 3 while their expenditures are in the ratio 2 : 3 :4 . If Mr Shah saves 20% of his income , find the ratio of their savings

.

02. the following is the pdf of a continuous random variable X

$$f(x) \quad = \quad \frac{x^2}{3} \quad ; \quad -1 < x < 2$$

$$\quad = \quad 0 \quad ; \quad \text{otherwise} \qquad \text{(i) Find cdf of X (ii) Hence find } P(X > 0) ; P(1 < X < 2)$$

03. there are four capsulation machines available in a pharmaceutical company , namely C_1 , C_2 , C_3 , C_4 and company has five types of antibiotic products A , B , C , D , E to be filled in capsules . The cost of performance of various products on different capsulation machines is given below in the matrix .

		ANTIBIOTICS				
		A	B	C	D	E
	C_1	27	18	---	20	21
CAPSUALTION	C_2	31	24	21	12	17
MACHINES	C_3	20	17	20	---	16
	C_4	21	28	20	16	27

Find the optimal assignments of antibiotic products to different capsulation machines if capsule C cannot be filled on machine C_1 and capsule D cannot be filled on machine C_3

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

01. Determine l_1 ; l_2 ; l_3 given that $l_0 = 100$; $q_0 = 0.10$; $q_1 = 1/9$; $p_2 = 15/16$

02. the coefficient of rank correlation of ranks obtained by 10 students in Statistics and Mathematics was found to be 0.2. It was later found that the difference in ranks in the two subjects obtained by one of the students was wrongly taken as 9 instead of 7 . Find the correct coefficient of rank correlation

03. a shopkeeper sold a TV set for ₹ 8,832/- after allowing 8% trade discount and 4% cash discount . If he made 38% profit , find the cost price and the market price of the TV set

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

01. the following results were obtained from record of age X and systolic blood pressure (Y) of a group of 10 men

	X	y
Mean	50	140
Variance	130	165

, $\Sigma(x-\overline{x})(y-\overline{y}) = 1220$

Obtain the regression line to estimate blood pressure of a man of age 40 years

02. Suppose X is a random variable with pdf

$f(x)$ = $\dfrac{k}{\sqrt{x}}$; $0 < x < 4$

= 0 ; otherwise Find k & E(X)

03. Minimize z = 2x + 4y , subject to 2x + y ≥ 2 , x + 3y ≥ 3 , 3x + 4y ≥ 6 , x , y ≥ 0