PAPER – II : MODEL PAPER – 03

(BASED ON MARCH 2016**)**

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. Anandi and Rutuja invested ₹ 10,000 each in a business . Anandi withdrew her capital after 7 months . Rutuja continued for the year . After one year the profit earned by them was ₹ 5,700 . Find the profit by each person

02. Calculate age specific death (A-SDR) rates for the following data

Age Group	Population In '000	No. of deaths
Below 10	25	50
10 – 30	30	90
30 – 45	40	160
45 – 70	20	100

03. for a bivariate data $b_{yx} = -1.2$ and $b_{xy} = -0.3$. Find correlation coefficient

04. In the pmf of a random variable X , two entries were missing .

X = x	1	2	3	4	5
P(X = x)	$\frac{1}{20}$	$\frac{3}{20}$	a	b	$\frac{1}{20}$

Find a and b given that **b = 2a**

05. from the regression equations :y = 4x – 5 and 3x = 2y + 5 .
find $\overline{x}$ and $\overline{y}$

06. the probability distribution function of continuous random variable X is given by

$f(x) = \frac{x}{8}$, $0 < x < 4$

$= 0$, otherwise Find $P(X > 3)$

07. Draw scatter diagram for the following data and interpret it

x	10	20	30	40	50	60	70
y	32	20	24	36	40	28	38

08. $n = 100$; $\bar{x} = 62$; $\bar{y} = 53$; $\sigma x = 10$; $\sigma y = 12$

$\Sigma(x - \bar{x})(y - \bar{y}) = 8000$. Find correlation coefficient

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

01. Determine l_{92} ; l_{93} given that

$l_{91} = 97$; $d_{91} = 38$; $q_{92} = 27/59$; $p_{93} = 15/32$

02. if for a bivariate data $\bar{x} = 10$, $\bar{y} = 12$, $V(x) = 9$, $\sigma y = 4$ and $r = 0.6$

estimate y when x = 5

03. Calculate CDR for the local population from the following data

Age Group	Population	No. of deaths
0 – 20	40000	350
20 – 65	65000	650
65 & above	15000	x

Find x if CDR = 13.4 per thousand

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

01. the coefficient of rank correlation of marks obtained by 10 students in English and Economics was found to be 0.5. It was later found that the difference in ranks in the two subjects obtained by one of the students was wrongly taken as 3 instead of 7 . Find the correct coefficient of rank correlation

02. Solve the following minimal assignment problem and hence find the minimum time where '–' indicates that job cannot be assigned to the machine

	Processing time in hrs				
Machines	A	B	C	D	E
M1	9	11	15	10	11
M2	12	9	–	10	9
M3	–	11	14	11	7
M4	14	8	12	7	8

03. There are five jobs , each of which is to be processed through three machines A , B and C in the order ABC . Processing time in hours are shown in the following table .Determine the optimal sequence for the five jobs and the minimum elapsed time . Also find the idle time for three machines

Job	1	2	3	4	5
A	3	8	7	5	4
B	4	5	1	2	3
C	7	9	5	6	10

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

01. Find the true discount , banker's discount and banker's gain on a bill of ₹ 36,600 due 4 months hence at 5% p.a.

02. Mr Anil wants to invest at most ₹ 60,000 in Fixed Deposit (F.D.) and Public Provident Fund (P.P.F.) He wants to invest at least ₹ 20,000 in F.D. and at least ₹ 15,000 in P.P.F. . The rate of interest on F.D. is 8% p.a. and that on P.P.F. is 10% p.a. Formulate the above problem as L.P.P to determine maximum yearly income

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

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

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

01. Mr. Rana plans to save for his son's higher studies . He wants to accumulate a sum of ₹ 2,00,000 at the end of 4 years . How much should he invest at the end of each year from now , if he can get interest compounded at 10% p.a. ($1.1^4 = 1.4641$)

02. A car valued at ₹ 4,00,000 is insured for ₹ 2,50,000 . The rate of premium is 5% less 20% . How much loss does the owner bear including the premium if the value of the car is reduced to 60% of its original value

03. The defects on a plywood sheet occurs at random with an average of one defect per 50 sq. ft. What is the probability that such sheet will have

(a) no defects (b) at least one defect

(Use $e^{-1} = 0.3678$)

DO NOT STOP

GET READY FOR NEXT