

PYBMS

Oct - 2008

CODE : MERCURY

Time : 2 Hrs.

Q.M. I (Old)

Marks : 60

Instructions : 1] All questions are compulsory .

2] Each question carries equal marks.

3] Simple calculators are allowed.

Q.1 a) Define (i) Geometric mean (ii) Median 04

b) Following data gives distribution of travelling time to office of some employees.

Travelling time : 0 - 20 20 - 40 40 - 60 60 - 80 80 - 100

in minutes

No. of employees : 5 20 - 21 17

Find missing frequency if qverage travelling time to office is 55 minutes. 06

c) Find mode for the following data. 05

Life of tube lights ( in hrs.)	No. of tube lights
300 - 400	20
400 - 500	25
500 - 600	40
600 - 700	32
700 - 800	15
800 - 900	8

Also fine mode graphically.

OR

Q.1 a) Give merits and demerits of mean 04

b) From the following distribution, calculate lower quartile  $Q_1$ , upper quartile  $Q_3$  and quartile deviation. 06

Income in Rs.	No. of persons
100 - 200	110
200 - 300	140
300 - 400	200
400 - 500	170
500 - 600	150
600 - 700	100

c) The distribution of heights of 65 children is given below

05

Height (in cm.)	No. of children
130 - 135	4
135 - 140	5
140 - 145	15
145 - 150	20
150 - 155	15
155 - 160	6

Plot (i) Frequency polygon

(ii) Less than ogive curve.

**Q.2 a)** Prepare a frequency distribution for the following data giving 1. Q. of 40 students (use Sturge's formula)

06

100,	105,	123,	115,	125,	108,	114,	109
112,	109,	107,	112,	116,	121,	126,	121
132,	134,	112,	115,	117,	102,	109,	119
125,	127,	129,	120,	127,	119,	113,	116
119,	129,	122,	121,	130,	118,	114,	125

**B)** Find geometric mean of the following data

05

$X_i$ :	35	60	62	81	105	172
$f_i$ :	2	5	6	8	5	3

c) The arithmetic mean of salaries of 50 workers was Rs.250. The average wages of 10 of them was Rs. 170 and that of another 25 of them was Rs. 190. Find the mean of the remaining 15 workers.

04

**OR**

**Q.2 a)** Find variance and standard deviation of the following data.

06

Class interval	Frequency
4 - 8	5
8 - 12	7
12 - 16	14
16 - 20	6
20 - 24	4

b) Define (i) Sample space & Event (ii) Coefficient of quartile deviation

04

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c) Following data gives values of monthly income and monthly Expenditure of 25 families.

Let X : Monthly income, Y : monthly Expenditure then (X, Y) values

(in '000Rs.) are

(12, 8) , (12, 14) , (20, 12) , (11, 07) , (12, 08)  
 (14, 12) , (18, 16) , (18, 14) , (12, 08) , (27, 12)  
 (16, 10) , (25, 12) , (25, 15) , (16, 05) , (28, 13)  
 (17, 12) , (18, 20) , (16, 12) , (14, 06) , (25, 12)  
 (18, 05) , (08, 10) , (08, 05) , (26, 08) , (26, 10)

Prepare bivariate frequency distribution taking class-intervals 5-10, 10-15, 15-20, ..... for both the variables.

write marginal distribution of Y

05

**Q.3 a) Define (i) Correlation coefficient**

04

(ii) Coefficient of Range

(iii) Quartile deviation

b) A committee of 6 is to be formed from 7 boys and 4 girls. Find the probability that the committee contains.

06

i) 2 girls and 4 boys

ii) All the girls

iii) At the most 4 boys

c) Find weighted average for the following data

05

X i :	425	448	450	460	425	482
w i :	10	15	10	12	11	8

where w i's are corresponding weightages.

**OR**

**Q.3 a) Find geometric mean of the following observations.**

05

X i : 4125 4826 5002 5124 5325

b) A bag contains 8 blue, 4 white and 3 green balls. 2 balls are selected randomly from the box. Find the probability that

06

i) both the balls selected are blue

ii) One ball is white and the other is green

iii) No green ball is selected

c) Find correlation coefficient for the following data -

04

$\Sigma x = 98,$	$\Sigma y = 82,$	$\Sigma x^2 = 1130,$
$\Sigma y^2 = 1380$	$\Sigma xy = 314$	$n = 12$

**Q.4 a)** Obtain the equation of line of regression of yield of rice on water supplied from the following data

**06**

water (in cm) (X)	yield of rice (in quintals) (Y)
30	3
45	5
60	6
70	7
90	8
105	9
120	9

**b)** Explain the concept of seasonal variations. Find 3 yearly moving average for following

**06**

Years	Sales (in '000 Rs.)
1991	100
1992	102
1993	105
1994	108
1995	107
1996	106
1997	103
1998	112
1999	113

**c)** Fill in the blanks

**03**

i) If  $b_{xy} = 1.6$  &  $b_{yx} = 2.8$ , then correlation coefficient  $r =$  \_\_\_\_\_

ii) If  $r = 0.92$ , then the two variables has \_\_\_\_\_ correlation.

iii) Median is same as \_\_\_\_\_ quartile

**OR**

**Q.4 a)** Given the following regression equations find  $\bar{x}$ ,  $\bar{y}$  and  $r$

**05**

$$100y = 45x + 1400$$

$$5x = 4y + 200$$

**b)** Find the combined mean and standard deviation given the following data

**05**

	Batch I	Batch II
Number	300	400
Arithmetic mean	60	67
Variance	16	25

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- c) Say with reasons, whether the following statements are true or false 05
- i) If  $P(A) = 0.2$ ,  $P(B) = 0.30$ ,  $P(A \cup B) = 0.1$  then  $P(A \cap B) = 0.4$
  - ii) No. of ways in which 4 students can be arranged for a photograph is  $4p_4$ .
  - iii) Scatter diagram can not give the degree of relationship.
  - iv) If  $b_{yx} = 0.4$ ,  $b_{xy} = 1.6$  then  $r = \pm 0.8$
  - v) Coefficient of correlation lies between 0 and 2

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