

F.Y. Bom (B/3) Oct - 2005
CHICKOO *quan. method.*

Time : 2 Hrs.

Marks : 50

- Instructions**
- 1) Each question carries equal marks.
 - 2) Figures to the right indicate full marks.
 - 3) Calculators are allowed.
 - 4) Use of statistical tables and log tables is allowed.

Q.1 A) Find the missing frequency given that the arithmetic mean of monthly expenditure is Rs. 5625. (5)

<u>Monthly expenditure</u> (in Rs.)	<u>No. of families</u>
2000 - 3000	10
3000 - 4000	15
4000 - 5000	30
5000 - 6000	-
6000 - 7000	65
7000 - 8000	25

B) What is harmonic mean ? (5)

A train covers a distance of 50 km at the rate of 120 km/hr and returns at the rate of 150 km/hr. What is the average speed of the train during the whole journey ?

C) Write a note on Kurtosis. (5)

If $Q_1 = 6.5$, $Q_2 = 8.8$ and $Q_3 = 12$

Find Bowley's measure of skewness and hence comment on the result.

OR

Q.1 A) Draw Histogram to represent the following data. Also draw a separate graph showing frequency curve. (5)

<u>Marks</u>	<u>No. of students</u>
10 - 20	7
20 - 30	10
30 - 40	12
40 - 50	15
50 - 60	5
60 - 70	3

Hence find mode graphically.

B) Define Geometric mean. (5)

C) Draw less than ogive curve for the following data and hence find. (5)

- i) Median ii) Q_1 from graph.

<u>Weight in Kg.</u>	<u>No. of children</u>
30 - 35	7
35 - 40	8
40 - 45	10
45 - 50	4
50 - 55	2

Q.2 A) Define i) Median (5)

- ii) Mode for grouped data i.e.

for observations x_1, x_2, \dots, x_n with frequencies f_1, f_2, \dots, f_n .

Find Median and mode for the following data -

101, 120, 115, 118, 121, 118, 113, 114, 118, 115, 125, 130.

B) i) Write merits and demerits of arithmetic mean. (5)

- ii) Define mean deviation about 'a' for observation x_1, x_2, \dots, x_n .

C) Calculate Karl-Pearson's correlation coefficient for the following data. (5)

x : 12 4 8 10 12 16

y : 8 10 15 16 20 25

OR

Q.2 A) Write merits and demerits of median. Define Minimal property of mean deviation. (5)

B) A bag contains 3 white and 4 black balls. 2 balls are drawn at random from the bag.

Find the probability of - (4)

- i) Drawing both the white balls
ii) One ball is white and other ball black.

C) Define : i) Independent events (2)

- ii) Impossible events

D) Means and standard deviations of the scores of a general knowledge test of two classes (4)

of different sizes of 30 and 70 are

$$\bar{x}_1 = 70, \bar{x}_2 = 81, \sigma_1 = 8, \sigma_2 = 12$$

Q.3 A) Marks of 25 students in Mathematics (X) and Statistics (Y) are given below : (5)

(58, 60), (60, 60), (52, 55), (48, 50), (45, 60), (50, 50), (58, 60), (52, 52), (40, 45), (46, 56),
 (60, 65), (60, 62), (64, 62), (62, 65), (48, 52), (55, 53), (52, 54), (54, 55), (60, 65), (42, 52),
 (48, 50), (45, 60), (62, 50), (65, 65), (48, 50)

- i) Prepare bivariate frequency distribution for the above data by taking class intervals.
 40 - 45, 45 - 50, 50 - 55,, etc.
- ii) Write marginal distribution of X.
- iii) Conditional distribution of Y when X takes values between 50 - 55.

B) Tickets numbered from 1 to 30 are well shuffled and a ticket is drawn from them. (5)

What is probability that the number on ticket drawn is

- i) an odd number
- ii) a perfect square
- iii) No. divisible by 2 and 3 both.

C) For bivariate data, (5)

Mean value of $x = 60$

Mean value of $y = 120.5$

Variance of $x = 30$

Variance of $y = 72.2$

and the coefficient of correlation = $r = 0.62$

Find lines of regression of x on y .

OR

Q.3 A) Following is the bivariate distribution of two variables X and Y. (5)

<u>Y/X</u>	<u>100-200</u>	<u>200-300</u>	<u>300-400</u>	<u>400-500</u>
10 - 20	2	-	3	2
20 - 30	4	5	3	3
30 - 40	1	2	1	4
40 - 50	1	3	-	1

- i) Write marginal distribution of X and Y.
- ii) Distribution of X when Y is greater than or equal to 30.
- iii) Distribution of Y when X is in between 200-300.

B) Define multiplication theorem of probability. Write sample spaces for the following (5) experiments -

- i) Three coins are tossed simultaneously.

C) Find coefficient of correlation for the following data. (5)

$$\Sigma x = 96, \quad \Sigma y = 84, \quad \Sigma x^2 = 1128, \quad \Sigma y^2 = 1380, \quad \Sigma xy = 312, \quad n = 12$$

comment on the result.

Q.4 A) The number of workers in a large factory in 1966 was 540 of which 30% were females and the rest males. In 1971, the strength of workers increased by 100 females and 200 males. In 1976, the total number of workers has increased by 25% over its value in 1971 while the increase in the number of male workers was 20 more than the increase in the number of female workers. Present the above data in tabular form. (6)

B) Average monthly expenditure on entertainment of 20 households in Rs. 1200. Later on it was found that expenditure of one household was wrongly taken on 1800 instead of the correct value 1300. Calculate the correct average. (4)

C) A committee of 4 is to be formed from 5 boys and 6 girls. In how many ways this can be done if

- i) Exactly one girl is to be included? (5)
- ii) No boy is to be included.
- iii) 2 boys and 2 girls are to be included.

OR

Q.4 A) There were 100 students in a class who appeared for the test in English. Out of 60 boys in all 40 passed in the test. In all, 20 students of the class used to wear glasses and of them 18 succeeded in the test including 10 boys. A total of 75 students from the class succeeded in the test while 12 boys used to wear glasses. Tabulate the above data. (6)

B) Fill in the blanks. (5)

- i) Value of probability always lies between and
- ii) Mean, Mode and Median are equal for distribution.
- iii) Median is same as the value of quartile.
- iv) If a distribution is having peak taller than that of a normal distribution, then it is called as.... kurtic.
- v) Probability of a 'certain event' is

C) Find mode of the following distribution - (4)

<u>I. Q. of group</u>	<u>No. of students</u>
10 - 30	5
30 - 50	9
50 - 70	14
70 - 90	12
90 - 110	10