

N. B. : 1. Question No.1 is compulsory.

1. Explain the following concepts (any five) : 15

- 1) Find arithmetic mean of the following data by short cut method.
12 18 21 14 26 20 23.
- 2) Find the range and its coef. from the following data.
106 108 134 126 120 129 145 156 160 143 148 101.
- 3) If $\sum d^2 = 30$ and $n = 10$ find coef. of rank correlation.
- 4) If $Q1 = 20.34$ and $Q3 = 61.45$ find Quartile deviation and coef. of quartile deviation.
- 5) If two cards are drawn from a pack of cards find the probability that both cards are king.
- 6) Write p.d.f. of Binomial and Poisson distribution.
- 7) What is Pay-off table and regret table?

2. A) If the mode of the following data is 47.5 find the missing frequency. 08

C.I.	0 – 10	10 – 20	20 - 30	30 – 40	40 – 50	50 – 60	60 – 70	70 - 80
F	7	9	16	-	40	35	10	02

B) The following pay-off is given for 3 states of nature and 3 course of action. 07
Find best decision using EMV criteria. Calculate EPPI and EVPI.

State of nature	Course of action			Probability
	A ₁	A ₂	A ₃	
High Demand	70	80	100	0.40
Average Demand	50	66	80	0.40
Low Demand	40	60	70	0.20

OR

C) Find std. deviation and coef of variation from the following data : 08

C.I.	0 – 04	04 – 08	08 – 12	12 - 16	16 - 20
F	54	120	66	30	02

D) The probability that a contractor fails to deliver standard orders is 0.25. 07
Assuming this situation as a Binomial distribution determine the prob. that out of 5 orders given to contractor :

- 1) will fail to deliver 3 or less orders in time
- 2) will fail to deliver more than 3 orders on time.

3. A) The following data gives heights (cms.) and weights (Kgs.) of 1000 policemen. Find the two regression lines and estimate the weight of a policeman whose height is 180 cms : 08

	Height (X)	Weight (Y)
Average	170	68.2
Std. Deviation	15	9

coef. of correlation (r) = 0.6

- B) Construct Cost of living Index numbers by family budget method from the following data : 08

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	15	100	17	95
B	25	70	26	75
C	05	05	04	06
D	08	25	10	10

OR

- C) A tobacco company claims that there is no relationship between smoking and lung cancer. To investigate the claim 300 males were given a medical test. The result of medical test is tabulated below : 08

	Lung Cancer	No Lung Cancer	Total
Smokers	75	105	180
Non-Smokers	25	95	120
Total	100	200	300

On the basis of above information can it be concluded that smoking and lung cancer are independent?

(Table value for X^2 at 5% L.S. for 2 d.f. is 6.19 and for 1 d.f. is 3.84).

- D) The following data refer to the number of defectives in 10 samples of 100 each. Construct np chart and comment on the process control : 07

Samples No.	1	2	3	4	5	6	7	8	9	10
No. of Defectives	4	8	11	3	11	7	7	16	12	6

4. Write short notes on the following (any three) : 15

- 1) Methods of collecting primary data.
- 2) Different types of graphs for representing data.
- 3) Correlation and regression.
- 4) Index numbers.
- 5) Properties of normal distribution.

OR

4. Ten candidates were given training for job. At the end of training they were given a proficiency test. The marks secured by them during training (x) and proficiency test (y) is given below : 15

x	44	49	52	52	51	76	65	60	63	58
y	58	45	60	48	80	58	50	77	46	48

Find Karl Pearson's coef. of correlation between them and comment on the result.