2 Marks Questions

UNIT-1

1. Define statistics
2. Explain merits of Median
3. Explain Data visualization
4. Explain about types of variables
5. Define population and Sample
6. For the following data $45, 55, 50, 45, 40, 55, 45, 55$ Find (i) mean (ii) median (iii) Mode

UNIT-2

1. Find normal equations (a) Straight line (b) parabola (c) Exponential function (d) Power function (Any one of them)
2. Explain correlation and regression

UNIT-3

1. Define conditional probability
2. Define (a) Binomial distribution (b) poisson Distribution (c) normal Distribution (d) uniform Distribution (Any one of them)
3. State Baye's theorem

UNIT-4

1. State central limit theorem
2. ~~Define level of significance~~ Explain probability Sampling
3. Explain Sampling Distribution
4. Explain (a) point estimation (b) Interval estimation
5. Explain about Maximum error

UNIT-5

1. Explain one-tail and two-tail test
2. Explain Type-1, Type-2 errors
3. Define Null hypothesis and Alternative hypothesis
4. Define Level of significance
5. Define critical region

Long Answer questions

1. Explain about collection of data

2. Explain about measures of central tendency

3. Explain about kurtosis and Skewness

4. Find the Mean for the following data (Model Sums)

(a)
Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of Students	12	18	27	10	17	6

(b)
x	19	21	23	25	27	29	31
$f(x)$	13	15	16	18	16	15	13

5. Calculate the median for the following data (Model Sums)

(a)
Class interval	5-10	10-15	15-20	20-25	25-30	30-35	35-40
frequency	6	8	17	21	15	11	2

(b)
Time	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55
No. of workery	8	10	12	20	15	15	8	6	6

6. Problems on Mode. Find mode (Model Sums)

C. I	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	5	8	7	12	28	20	10	10

7. Find the mean deviation about (a) mean (b) Median for the following data (model sums)

(a)
x_i	2	5	7	8	10	35
f_i	6	8	10	6	8	2

(b)
Marks obtained	0-10	10-20	20-30	30-40	40-50
No. of Students	5	8	15	16	6

8. Find the variance and Standard deviation for the following data (Model Sums)

(i) 45, 60, 62, 60, 50, 65, 58, 68, 44, 48

(ii)
class interval	30-40	40-50	50-60	60-70	70-80	80-90	90-100
frequency	5	7	12	15	8	3	2

9. Calculate Karl Pearson's coefficient of Skewness for the following data (model Sums)

(a)
Variable	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
frequency	2	5	7	13	21	16	8	3

(b) 25, 15, 23, 40, 27, 25, 23, 25, 20

10. From the following distribution, calculate (i) first 4 moments about the mean (ii) Skewness based on moments (iii) Kurtosis (model Sums)

Income (RS)	0-10	10-20	20-30	30-40	40-50
frequency	1	3	4	2	

11. Explain Measures of Kurtosis.

12. Calculate the lower and upper quartiles from the distribution marks obtained by 48 Students given below. Also find semi inter quartile range (model Sums)

Marks	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
frequency	5	6	15	10	5	4	2	2

UNIT - 2

1. Difference between correlation and Regression

2. Find the Karl Pearson's coefficient of correlation for the following data (Model Sums)

(a)
X	38	45	46	38	35	38	46	32	36	38
Y	28	34	38	34	36	26	28	29	25	36

(b)
X	2	4	6	8	10	12	14
Y	4	2	5	10	4	11	12

3. Find the rank correlation coefficient for the following data (Model Sums)

(a)
X	2	4	5	6	8	11
Y	18	12	10	8	8	5

4. For the following data. Find two regression lines (Model Sums)

(a)
X	1	2	3	4	5
Y	15	25	35	45	55

(b)
x	10	12	13	12	16	15
y	40	38	43	45	37	43

5. Find the coefficient of correlation and the means of x and y

(a) $5x - 2y = 7$, $5x - 8y = -17$ (b) $2y - x - 50 = 0$, $3y - 2x - 10 = 10$

6. By the method of Least squares, find the straight line that best fit from the following data (Model sums)

(a)
x	1	2	3	4	5
y	14	27	40	55	68

(b)
x	0	1	2	3	4
y	2.1	3.5	5.4	7.3	8.2

7. Fit a second degree polynomial or parabola (Model Sums)

(a)
x	1	2	3	4	5
y	10	12	8	10	14

(b)
x	1	2	3	4	5	6	7
y	2.3	5.2	9.7	16.5	29.4	35.5	54.4

8. Fit a curve of the type $y = ae^{bx}$ (Model Sums)

(a)
x	1	2	3	4	5
y	2.6	3.3	4.2	5.4	6.9

(b)
x	2	4	6	8	10
y	4.077	11.084	30.128	81.897	222.62

9. Fit a curve of the type $y = ab^x$ (Model Sums)

(a)
x	2	3	4	5	6
y	8.3	15.4	33.1	65.2	127.4

(b)
x	1	2	3	4	5	6
y	151	100	61	50	20	8

UNIT - 3

1. State and prove Baye's theorem

2. Find the mean and variance of Binomial distribution

3. Write the ~~properties~~ characteristics of normal Distribution

4. What is the probability that a card drawn at random from the pack of playing cards may be either a Spade or an ace (Model Sums)

5. Find the probability of drawing 2 red balls in succession from a bag containing 4 red and 5 black balls when the ball that is drawn first is (i) not replaced (ii) replaced (Model Sums)

6. A bag A contains 2 white and 3 red balls and a bag B contains 4 white and 5 red balls. one ball is drawn at random from one of the bags and it is found to be red. Find the probability that the red ball drawn is from bag B (Model Sums)

7. A continuous random variable has the following probability density function $f(x) = \begin{cases} kx^2, & 0 < x < 3 \\ 0 & \text{else where} \end{cases}$ (Model Sums) Determine (i) K (ii) cumulative distribution function $F(x)$

8. 20 % of items produced from a factory are defective. Find Probability that in a sample of 5 chosen at random (i) none is defective (ii) one is defective (iii) $P(1 < x < 4)$ [Model Sums]

9. If the masses of 300 students are normally distributed with mean 68 kgs and S.D 3kgs, how many students have masses (i) greater than 72 kg (ii) less than or equal to 64 kgs (iii) Between 65 and 71 kgs inclusive (Model Sums)

1. A population consists of five numbers 2, 3, 6, 8 and 11 consider all possible Samples of Size two which can be drawn
   (a) with replacement (b) without replacement from the population
   Find (i) The mean of the population (Model Sums)
   (ii) The S.D of the population
   (iii) The mean of Sampling distribution of means
   (iv) The S.D of Sampling distribution of means.

2. If the population is 3, 6, 9, 15, 27. Consider all possible Samples of Size 3 which can be draw (a) with replacement (b) without repace ment from the population. Find
   (i) Mean of Population (ii) S.D of Population
   (iii) Mean of Sampling distribution of means [Model Sums]
   (iv) S.D of Sampling distribution of mean.

3. A random Sample of size 64 is taken from a normal Population with $\mu = 51.4$ and $\sigma = 68$. what is the probability, that the mean of the Sample will (Model sums)
   (a) exceed 52.9 (b) between 50.5 & 52.3 (c) less than 50.6

4. When a Sample is taken from an infinite population, what happened to the standard error of mean if the sample Size is decreased from 800 to 200 (Model Sums)

5. What is the maximum error one can expect to make with Probability 0.90 when using the mean of a random Sample of size n = 64 to estimate the mean of population with $\sigma^2 = 2.56$ (Model Sums)

6. A random Sample of size 81 was taken whose variance is 20.25 and mean is 32, construct 98% confidence interval

1. The means of two large samples of sizes 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of S.D 2.5 inches (Model Sums)

   (Two mean problem)

2. According to the norms established for a mechanical (or an electrical) aptitude test, persons who are 18 years old have an average height of 73.2 with S.D of 8.6. If 4 randomly selected persons of that age averaged 76.7, test the hypothesis $\mu = 73.2$ against alternative hypothesis $\mu > 73.2$ at the 0.01 level of Significance (Model Sums)

   (one mean problem)

3. The average marks Scored by 32 boys is 72 with a S.D of 8 while that for girls is 70 with a S.D of 6. Does this indicate that the boys perform better than girls at level of Significance 0.05? (Model Sums)

4. In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in city are smokers (Model Sums)

   (Single proportion Sums)

5. In two large population, there are 30% and 25% respectively of fair haired people. Is this difference likely to be hidden in Samples of 1200 and 900 respectively from the two populations (Model Sums) (Two proportion)

6. A machine puts out 16 imperfect articles in a sample of 500 articles. After the machine is overhauled it puts out 3 imperfect articles in a sample of 100 articles. Has the machine improved.

7. A random Sample of Size 16 values from a normal population showed a mean of 53 and a sum of squares of deviations from the mean equals to 150. can this Sample be regarded as taken from the population having 56 as mean? obtain 95% confidence limits of the mean of the population   (t-test problems) [Model Sums]

8. Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results. (t-test)   (Model Sums)

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	—

9. The nicotine contents in milligrams in two Samples of tobacco were found to be as follows (F-test) [Model Sums]

Sample A	24	27	26	21	25	—	
Sample B	27	30	28	31	22	36.	

can it be said that the two Samples have come from the same normal population.

10. Time taken by the workers in performing a job by method I and method II is given below.   (F-test)

method I	20	16	26	27	23	22	—
method II	27	33	42	35	32	34	38.

Do the data Show that the variances of time distribution from Population from which these Samples are do not differ Significantly

11. A die is thrown 264 times with the following results. Show that the die is biased. (Given $X^2_{0.05} = 11.07$ for 5 d.f)

No. appeared on the die	1	2	3	4	5	6
frequency	40	32	28	58	54	52

(X^2-test)   (Model Sums)