

STATISTICAL METHODS
QUESTION BANK

UNIT I: Introduction of Statistics

Short Questions

1. Define the term Statistics?
2. Define Classification ?
3. Define Primary data?
4. Define Secondary data?
5. Explain Histogram?
6. Explain pie diagram ?
7. Write any two merits and demerits of Mean?
8. Write any two merits and demerits of Median?
9. Write any two merits and demerits of Mode?
10. Calculate Mean of 23,45,12,11,10 & 34.
11. Calculate median of 34,45,7,9,10,22,13.
12. Calculate mode of 23,56,7,89,90,23,23,12.
13. Calculate Geometric mean of 2,24,5,67,89,122.
14. Calculate Harmonic mean of 34,6,78,23,13,12,11.
15. Calculate mean of the following data.

X	10	13	14	16	17	20	21
F	5	3	7	16	18	25	22

16. Calculate mode from the following data.

X	10	20	30	40	50	60	70
F	23	45	67	2	49	56	60

LONG QUESTIONS:

1. Explain Functions of Statistics?
2. Explain Graphical and diagrammatic presentation of data?



STATISTICAL METHODS
QUESTION BANK

3. Explain Tabulation of data?

4. Explain Measures of central tendency?

5. Find mean to the following data.

Classes	0-10	10-20	20-30	30-40	40-50	50-60	60-70
frequency	23	6	67	3	5	9	10

6. Find Median to the Following data.

Marks	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800
No.of students	34	56	8	90	122	123	34	9

7. Calculate Mode to the following data

Income in thousands	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180
No.of persons	24	56	34	122	23	11	34	12	18

8. Find Geometric mean to the following data.

Classes	0-100	100-200	200-300	300-400	400-500	500-600	600-700
frequency	23	6	67	3	5	9	10

9. Find Harmonic mean to the following data.

Classes	0-5	5-10	10-15	15-20	20-25	25-30	30-40
frequency	2	16	37	3	15	9	11

10. Find mean to the following data.

Classes	0-15	15-30	30-45	45-60	60-75	75-90	90-105
frequency	3	6	16	30	15	11	10

11. Explain Geometric Mean , Merits and Demerits of Mean ?

12. Explain Harmonic Mean ,Merits and demerits of Harmonic mean?



STATISTICAL METHODS
QUESTION BANK

UNIT II : Measures of Dispersion

Short Questions

1. Define Range?
2. Write the formula for Quartile deviation and its co-efficient?
3. . Write the formula for Mean deviation and its co-efficient?
4. . Write the formula for standard deviation and its co-efficient?
5. Define Skewness?
6. Define Kurtosis?
7. Find Range to 23,45,6,78,89,12,5,1.
8. Find Q_1 and Q_3 to the data 21,34,6,7,90,23,45,1,5.
9. Find D_1 and D_9 for 45,8,90,34,9,5,4,3,2,67.
10. Calculate Mean deviation from median to the data 23,45,6,78,9,1,10,45,5,2.
11. Calculate Standard deviation to the following data 34,3,56,64,23,13,15,2,5.
12. Calculate Quartile deviation to the following data.

X	10	12	14	16	17	20	21
F	5	3	7	1	15	25	22

LONG QUESTIONS:

1. Explain Measures of Dispersion?
2. Explain Skewness and methods for measuring Skewness?
3. Explain Kurtosis?
4. Calculate Quartile Deviation and its co-efficient to the following data.

Classes	0-15	15-30	30-45	45-60	60-75	75-90	90-105
frequency	6	15	16	3	11	13	10



STATISTICAL METHODS
QUESTION BANK

5. Calculate Mean Deviation from mean its co-efficient to the following data.

Classes	0-5	5-10	10-15	15-20	20-25	25-30	30-40
frequency	2	13	35	13	15	12	11

6. Calculate Mean Deviation from median its co-efficient to the following data.

Income in thousands	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180
No.of persons	4	6	34	12	23	11	4	12	8

7. Calculate Standard Deviation its co-efficient to the following data.

Classes	0-50	50-100	100-150	150-200	200-250	250-300	300-350
frequency	20	16	35	3	10	5	11

8. Examine which group is more consistent from the following data.

Classes	0-5	5-10	10-15	15-20	20-25	25-30	30-40
Group A (Frequency)	2	10	31	3	10	12	11
Group B (frequency)	3	12	30	4	5	13	10

9. Calculate Karl Pearson's co efficient of Skewness to the following data

Classes	0-2	2-4	4-6	6-8	8-10	10-12	12-14
frequency	20	1	7	3	15	19	11

10. Calculate Bowley's co efficient of Skewness to the following data

Classes	0-20	20-40	40-60	60-80	80-100	100-120	120-140
frequency	11	14	111	33	15	10	1

11. Calculate Kelly's co efficient of Skewness to the following data

Classes	0-50	50-100	100-150	150-200	200-250	250-300	300-350
frequency	20	16	35	3	10	5	11



STATISTICAL METHODS
QUESTION BANK

12. Calculate a measure of relative Kurtosis for the following data and comment on the result obtained:

Classes	0-15	15-30	30-45	45-60	60-75	75-90	90-105
frequency	3	6	16	30	15	11	10

UNIT : III Sampling Distribution

Short Questions :

1. Define population and sample?
2. Define parameter and Statistic?
3. Define standard error of a statistic?
4. Define Estimator and estimate?
5. Define point estimation and interval estimation?
6. Find population correction factor if $n = 5$ and $N = 30$
7. The variance of a population is 4. The size of the sample collected from the population is 155. What is the standard error of mean?
8. If we can assert with 95% that maximum error is 0.05 and $p = 0.2$. Find the size of the sample.
9. A random sample of size 100 has a standard deviation of 5. What can say about the maximum error with 95% confidence.
10. The mean and standard deviation of a population are 11795 and 14,054 respectively. Construct 99% confidence interval for the true mean. If sample mean is 11 795 and $n = 50$.
11. How many different samples of size $n = 2$ can be chosen from a finite population of size $N = 25$.

LONG QUESTIONS:

1. Explain sampling and some important methods of sampling?
2. A population consists of five numbers 2,3,6,8, and 11. Consider all possible samples of size two Which can be drawn with replacement from this population. Find i) The population mean. ii) The standard deviation of the population. iii) The mean of the sampling distribution of means. iv) standard deviation of the sampling distribution of means.
3. A population consists of five numbers 5,2,6,12, and 11. Consider all possible samples of size two Which can be drawn with out replacement from this population. Find i) The population



STATISTICAL METHODS
QUESTION BANK

mean. ii) The standard deviation of the population. iii) The mean of the sampling distribution of means. iv) standard deviation of the sampling distribution of means.

4. A population consists of five numbers ,3,6,9,15 and 27. Consider all possible samples of size three Which can be drawn with out replacement from this population. Find i) The population mean. ii) The standard deviation of the population. iii) The mean of the sampling distribution of means. iv) standard deviation of the sampling distribution of means.

5. A population consists of six numbers 4,8,12,16,20 and 24. Consider all possible samples of size two Which can be drawn with out replacement from this population. Find i) The population mean. ii) The standard deviation of the population. iii) The mean of the sampling distribution of means. iv) standard deviation of the sampling distribution of means.

6. Show that sample mean is an unbiased estimator of population mean.

7. Show that $s^2 = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2$ is not unbiased estimator of the parameter σ^2 , but $S^2 = \frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2$ is unbiased estimator of the parameter σ^2 .

8. a) A sample of size 300 was taken whose variance is 225 and mean 54. Construct 95% confidence interval for the mean. And also find maximum error of mean at 95% confidence?

b) A sample of size 16 was taken whose standard deviation 100. and mean 53. Construct 99% confidence interval for the mean. And also find maximum error of mean at 99% confidence?

9. a) A random sample of 8 envelopes is taken from the letter box of a post office and their weights in grams are found to be : 12.1, 11.9, 12.4, 12.3, 11.5, 11.6, 12.1, and 12.4. find maximum error of mean at 95% confidence and also construct 95% confidence interval for the mean.

b) Among 100 fish caught in a large lake, 18 were inedible due to the pollution of the environment. With what confidence can we assert that the error of this estimate is at most 0.065?

10) a) Find 95% confidence limits for the mean of a population from which the following sample was taken 15, 17, 10, 18, 16, 9, 7, 11, 13, 14.

b) What is the size of the sample required to estimate an unknown proportion to within a maximum error of 0.06 with atleast 95% confidence.

UNIT IV : Testing of Hypothesis

Short Questions:



STATISTICAL METHODS
QUESTION BANK

1. Define type I error
2. Write the test statistic of single mean in large samples
3. Write about Null Hypothesis
4. What is mean by level of significance
5. Define Left tailed test
6. Write about alternative hypothesis.
7. Define critical region.
8. Define type II error.
9. Write the test statistic of single proportion in large samples.
10. Write the test statistic for difference of mean in large samples.
11. Write the test statistic for difference of two proportions in large samples.
12. Define Right tailed test

LONG QUESTIONS:

1. The means of two large sample 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
2. Experience has shown that 20% of a manufactured product is of the top quality. In one day's production of 400 articles only 50 are of top quality, test the hypothesis at 0.05 level
3. A sample of 64 students have a mean weight of 70 kgs. Can this be regarded as a sample from a population with mean weight 56 kgs and standard deviation 25 kgs.
4. Random samples of 400 men and 600 women were asked whether they would like to have a flyover near the residence, 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favor of the proposal are same, at 5% level.
5. A die was thrown 9000 times and of these 3220 yielded a 3 & 4, Is this consistent with the hypothesis that the die was unbiased?
6. In two large populations, there are 30% and 25% respectively of fair haired people is this difference likely to be hidden in samples of 1200 and 9000 respectively from the two population.
7. A simple sample of the heights of 6400 English men has a mean of 67.585 inches and a S.D of 2.56 inches while a simple sample of height of 1600 Australians has mean of 68.55 and a S.D



STATISTICAL METHODS
QUESTION BANK

of 2.52.D the data indicate the Australians are on the average taller than Englishmen use 1% l.o.s.

8. In a city A 20% of a random sample of 900 school boys has certain slight physical defect .In another city B 18.5% of a random sample of 1600 schoolboys has the same defect . Is the difference between the proportion significance at 5% l.o.s.

UNIT V : Analysis of variance

Short Questions

- 1.write the types of correlation
- 2.Test whether the equations $2x + 3y = 4$, and $x-y=5$ represent valued regression lines
- 3.Define correlation
- 4.Write any two use of regression
5. Write the angle between the two regression lines.
6. Find correlation co-efficient from the following two Regression equations.
$$Y = \frac{1}{2} X + 25, X = \frac{3}{2} Y - 5.$$
7. Write the two Regression equations.
8. Write the relation between correlation co-efficient and two Regression co- efficient.
9. Write any two properties of Regression co-efficients.
10. Write about one way classification.
11. Write about two way classification.

LONG QUESTIONS

- 1.Obtain the rank correlation coefficient for the following data.

X	68	64	75	50	64	80	75	40	55	64
y	62	58	68	45	81	60	68	48	50	70



STATISTICAL METHODS
QUESTION BANK

2. From the following data calculate the correlation coefficient.

X	48	33	40	9	16	16	65	24	16	57
y	13	13	24	6	15	64	20	9	16	19

3. From the following data calculate the correlation coefficient.

X	23	33	45	78	16	16	65	24	16	57
y	11	13	24	43	15	64	20	45	56	64

4. Obtain the rank correlation coefficient for the following data.

X	56	78	75	50	78	80	75	56	56	56
y	62	54	68	45	81	54	68	54	50	70

5. Find if there is any significant correlation between the heights and weights given below

Height in inches	57	59	62	63	64	65	55	58	57
Weight in lbs	113	117	126	126	130	129	111	116	112

6. A random sample of 5 college students is selected and their grades in mathematics and statistics are found to be

	1	2	3	4	5
mathematics	85	60	73	40	90
statistics	93	75	65	0	80

Calculate Spearman's rank correlation coefficient.

7. A test was given to five student taken at random from the class of three schools of a town



STATISTICAL METHODS
QUESTION BANK

.Carry out the ANOVA and state your conclusions.

School I	9	7	6	5	8
School II	7	4	5	4	5
School III	6	5	6	7	6

8. Solve using One-way ANOVA method

A	7	3	6	9	1
B	2	5	7	8	1
C	3	5	7	8	5
D	2	5	6	7	9

9. Solve using two –way ANOVA

	1	2	3	4	5	6	7
1	13	15	14	14	15	16	27
2	10	12	11	15	10	11	12
3	11	14	17	13	12	12	10

10. Obtain two Regression lines for the following data.

X	56	78	75	50	78	80	75	56	56	56
y	62	54	68	45	81	54	68	54	50	70



STATISTICAL METHODS
QUESTION BANK



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