AIML/Lib

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BT-3/D-22 **43228**

APPLIED STATISTICAL ANALYSIS FOR AI
Artificial Intelligence and Machine Learning
BS-CS-AIML-201A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) What is statistics and explain statistics in our everyday life ?

(b) Retail stores experience their heaviest returns in December each year. Most are gifts that, for some reason, did not please the recipient. The number of items returned, by a sample of 30 persons at a large discount department store, are observed and the data of table given below are obtained.

Number of items returned

1	4	3	2	3	4	5	1	2	1
2	5	1	4	2	1	3	2	4	1
2	3	2	3	2	1	4	3	2	5

Determine the frequency distribution.

Draw the line diagram and the histogram of the frequency distribution.

2. Explain in detail :

(a) Population

(b) Sample

(c) Types of sampling

(d) Sampling classification

(e) Graphical representation of data.

3. The monthly rents for 7 one-bedroom apartments located in one area of the city, are :

625 740 805 670 705 740 870

(a) Give two possible factors that may contribute to variation in the monthly rents.

(b) Calculate the sample variance.

(c) Calculate the sample standard deviation.

4. (a) Find the mean and standard deviation of the following :

Series	Frequency
15-20	2
20-25	5
25-30	8
30-35	11
35-40	15

40-45	20
45-50	20
50-55	17
55-60	16
60-65	13
65-70	11
70-75	5

(b) A die is tossed thrice. A success is 'getting 1 or 6' on a toss. Find the mean and variance of number of successes.

5. (a) A coin was tossed 400 times and the head turned up 216 times. Test the hypothesis that the coin is unbiased.

(b) A normal population has a mean of 6.8 and standard deviation of 1.5. A sample of 400 members gave a mean of 6.75. Is the difference significant ?

6. (a) Samples of sizes 10 and 14 were taken from two normal populations with standard deviation 3.5 and 5.2. The sample means were found to be 20.3 and 18.6. Test whether the means of the two populations are the same at 5% level.

(b) Explain Analysis of Variance (ANOVA). Distinguish between one-way and two-way ANOVA technique.

7. Calculate the co-efficient of correlation and obtain the least square regression line of y on x for the following data :

x	1	2	3	4	5	6	7	8	9
y	9	8	10	12	11	13	14	16	15

8. The marks secured by recruits in the selection test (X) and in the proficiency test (Y) are given below :

Serial No.	X	Y
1	10	30
2	15	42
3	12	45
4	17	46
5	13	33
6	16	34
7	24	40
8	14	35
9	22	39

Calculate the rank correlation co-efficient.