**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY**
**(AUTONOMOUS) :: PUTTUR**
Siddharth Nagar, Narayanavanam Road – 517583

**QUESTION BANK (DESCRIPTIVE)**

**Subject with Code: STATISTICS FOR MANAGERS (25MB9005)** **Course & Branch**: MBA

**Year & Semester**: **I Year I - Sem** **Regulation:** R25

## UNIT –I

## INTRODUCTION TO STATISTICS

**1.** Define Statistics? Explain the characteristics of statistics? **[L2,CO1,10M]**

**2.** What do you mean by Statistics? Explain Scope of statistics. **[L2,CO1,10M]**

**3.** You are given the following incomplete information and it's Mean 25. Find out the missing frequencies. **[L5,CO1,10M]**

| Class Interval | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | Total |
|---|---|---|---|---|---|---|
| Frequency | 5 | - | 15 | - | 5 | 45 |

**4.** From the following marks of 100 students compute the Mean Deviation and its coefficient. **[L5,CO1,10M]**

| Marks | 20 - 25 | 25 - 30 | 30 - 35 | 35 - 40 | 40 - 45 | 45 - 50 | 50 - 55 | 55 - 60 | 60 – 65 |
|---|---|---|---|---|---|---|---|---|---|
| No. of Students | 6 | 12 | 17 | 28 | 12 | 10 | 8 | 5 | 2 |

**5.** Compute Quartile Deviation and its Coefficient from the following distribution. **[L5,CO1,10M]**

| Weekly wages (Rs.) | 4-8 | 8-12 | 12-16 | 16-20 | 20-24 | 24-28 | 28 - 32 | 32 - 36 | 36-40 |
|---|---|---|---|---|---|---|---|---|---|
| No. of Workers | 6 | 10 | 18 | 30 | 15 | 12 | 10 | 6 | 2 |

**6.** If the Median of the given data is 35, Find the missing frequency; **[L5,CO1,10M]**

| X | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
|---|---|---|---|---|---|---|---|
| F | 10 | 20 | 35 | 50 | ? | 25 | 15 |

7. a) The mean age of a group of 100 children was 9.35 years. The mean age of 25 of them was 8.75 years and that of 65 was 10.51 years. What was the mean age of the remaining children? **[L5,CO1,5M]**

**b)** Write a short note on Measures of central tendency. **[L1,CO1,5M]**

**8.** Calculate the Standard Deviation and its coefficient from the following data. **[L5,CO1,10M]**

| Weight in Kg. | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
|---|---|---|---|---|---|
| Frequency (F) | 3 | 7 | 10 | 5 | 3 |

**9.** Calculate Mode from the following data. **[L5,CO1,10M]**

| Class Interval | 125-130 | 130-135 | 135-140 | 140-145 | 145-150 |
|---|---|---|---|---|---|
| No. of Boys | 7 | 14 | 10 | 10 | 9 |

**10. a)** Explain the Measures of Dispersion. **[L2,CO1,5M]**

**b)** Find the Range and coefficient of Range from the following data: **[L5,CO1,5M]**

20,26,22,28,24,30,34,32

## UNIT –II

## CORRELATION & REGRESSION

**1.** From the following table calculate the coefficient of correlation by Karl Pearson's method. Arithmetic means of X and Y variables are 6 and 8 respectively. **[L4,CO2,10M]**

| | | | | | |
|---|---|---|---|---|---|
| X | 6 | 2 | 10 | - | 8 |
| Y | 9 | 11 | - | 8 | 7 |

**2.** Calculate the coefficient of correlation from the following data and its probable error. **[L4,CO2,10M]**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Marks in Statistics (X) | 30 | 60 | 30 | 66 | 72 | 24 | 18 | 12 | 42 | 6 |
| Marks in Accountancy (Y) | 6 | 36 | 12 | 48 | 30 | 6 | 24 | 36 | 30 | 12 |

**3.** Compute Karl Pearson's coefficient of correlation for the following data. What conclusion do you draw from the result? **[L4,CO2,10M]**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Supply (Quintals) | 30 | 29 | 29 | 25 | 24 | 24 | 24 | 21 | 18 | 15 |
| Price (Rs.) | 11 | 12 | 13 | 14 | 15 | 16 | 15 | 17 | 18 | 20 |

**4.** Calculate the correlation coefficient between the variables X and Y from the following figures: **[L5,CO2,10M]**

$n = 30 \quad \sum x = 118 \quad \sum x2 = 556 \quad \sum xy = 368 \quad \sum y = 93$
$\sum y2 = 309$

**5.** Ten competitors in a voice contest are ranked by three judges in the following order: **[L5,CO2,10M]**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Judge 1 | 1 | 6 | 5 | 10 | 3 | 2 | 4 | 9 | 7 | 8 |
| Judge 2 | 3 | 5 | 8 | 4 | 7 | 10 | 2 | 1 | 6 | 9 |
| Judge 3 | 6 | 4 | 9 | 8 | 1 | 2 | 3 | 10 | 5 | 7 |

**6.** Construct two Regression equations for the following data and estimate the value of X. When Y = 70 and Y, when X= 650. **[L2,CO2,10M]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X | 100 | 200 | 300 | 400 | 500 | 600 | 700 |
| Y | 30 | 50 | 60 | 80 | 100 | 110 | 130 |

**7.** Determine the Regression equation of X on Y and Y on X for the following data: **[L5,CO2,10M]**

| | | | | | |
|---|---|---|---|---|---|
| X | 12 | 14 | 16 | 20 | 32 |
| Y | 34 | 40 | 38 | 42 | 50 |

**8.** Calculate Co-Efficient of Correlation and the Probable Error and comment on the significance of the correlation for the following data: [L5, CO4, 10M] **[L5,CO2,10M]**

| | | | | | | |
|---|---|---|---|---|---|---|
| X | 6 | 7 | 7 | 9 | 10 | 12 |
| Y | 18 | 16 | 17 | 19 | 19 | 21 |

**9.** Elaborate methods of studying Correlation. **[L2,CO2,10M]**

**10.** Write a note on meaning and utility of regression analysis. **[L1,CO2,10M]**

## UNIT – III

## PROBABILITY

| | | | |
|---|---|---|---|
| **1.** | | Consider a pack containing 4 blue, 2 red and 3 black pens. If a pen is drawn at random from the pack, replaced and the process repeated 2 more times, What is the probability of drawing 2 blue pens and 1 black pen? | **[L3,CO3,10M]** |
| **2.** | | A fair die is rolled twice to obtain two numbers. Let X1 = result of the first roll and X2 = result of the second roll. If X1+X2 = 7, what is the probability that X1 = 4 or X2 = 4? | **[L3,CO3,10M]** |
| **3.** | | Two students are selected from a class to the quiz team. If one of the students selected is a girl, what is the probability that both the students selected are girls? | **[L3,CO3,10M]** |
| **4.** | | A testing procedure for a certain disease correctly gives positive report 98% of the time and correctly gives negative report 96% of the time. If the disease has infected 1% of the population and one randomly selected person is tested positive, what is the probability that he is infected by the disease? | **[L3,CO3,10M]** |
| **5.** | **a)** | If we toss a coin 20 times and getting head is the success then what is the mean of success? | **[L3,CO3,3M]** |
| | **b)** | If we toss a coin 20 times and getting head is the success then what is the Standard Deviation and variance of the distribution? | **[L3,CO3,7M]** |
| **6.** | | A Factory produces light bulbs and the probability that a randomly selected bulb is defective is 0.1. If 10 bulbs are selected at random, What is the probability that exactly two bulbs are defective? | **[L3,CO3,10M]** |
| **7.** | **a)** | A random variable X follows a uniform distribution over the interval [10, 20]. Find the mean and variance of X. | **[L3,CO3,5M]** |
| | **b)** | A random variable X follows a uniform distribution with a=2 and b=8. Find the probability that X lies between 4 and 6. | **[L3,CO3,5M]** |
| **8.** | **a)** | A traffic signal experiences an average of 3 malfunctions per week. What is the probability that it will malfunction exactly 4 times in a two-week period? | **[L3,CO3,5M]** |

**b)** A bookshop receives, on average, 2 online orders per hour. What is the probability that the shop receives at least one order in an hour? **[L3,CO3,5M]**

**9. a)** 15000 students appeared for an examination. The mean marks were 49 and the standard deviation of marks was 6. Assuming the marks to be normally distributed, What proportion of students scored more than 55 marks? **[L3,CO3,5M]**

**b)** If in the same examination, Grade "A" is to be given to students scoring morethan 70 marks, What proportion of Students will receive grade "A"? **[L3,CO3,5M]**

**10. a)** In a city the probability of rain in the evening is 5% according to historical data for a particular season and 60% of the time when there is a rain, it leads to traffic jam. If in that city traffic jam probability is 10%, and in an evening there is a traffic jam, what is the probability that it has rained? **[L3,CO3,5M]**

**b)** For a particular brand of computers, if it has hard disk problems 80% of the times the startup is slow. As per manufacturer's description, within warranty period, the probability of a slow startup is 2% whereas the probability of hard disk problem is 0.5%. If the computer is starting slow in the warranty period, what is the probability that the hard disk has developed problems? **[L3,CO3,5M]**

## UNIT-IV

## TESTING OF HYPOTHESIS

**1.** A random sample of size 20 from a normal population gives a sample mean of 42 and sample standard deviation (S.D) of 6. Test the hypothesis that the population mean is 44. **[L6,CO4,10M]**

**2.** The following data shows the retail prices of certain commodities selected at random in three different places. Carryout the analysis of variance to test the significance of the difference between the prices of the commodity in three places. **[L4,CO4,10M]**

| **A** | **B** | **C** |
|---|---|---|
| 6 | 9 | 5 |
| 7 | 10 | 6 |
| 5 | 11 | 4 |
| **18** | **30** | **15** |

**3.** Explain types of Z – tests and T - tests. **[L2,CO4,10M]**

**4.** A random sample of 50 items gives the mean 6.2 and variance 10.24 can it be regarded as dawn from a normal population with 5.4 at 5% level of significance? **[L3,CO4,10M]**

**5.** **a)** Define Hypothesis. Explain the importance of hypothesis testing. **[L2,CO4,5M]**

**b)** Explain the process of hypothesis testing. **[L2,CO4,5M]**

**6.** A potential buyer of light bulbs bought 50 bulbs of each of two brands. Open testing these bulbs he found that brand A had a mean life of 1282 hours with a standard deviation 80 hours. Whereas brand B had a mean life of 1208 hours with standard deviation of 94 hours. Can the buyer be quit certain that two brands do differ in quality. **[L5,CO4,10M]**

**7.** A study claims that all the adults spend an average of 14 hours or more on chores during a weekend. A researcher wanted to check if this claim is true. A random sample of 200 adults taken by this researcher showed that these adults spend an average of 13.75 hours on chores during a weekend with standard deviation of 3 hours. Test the claim is true at 5% level of significance. **[L3,CO4,10M]**

**8.** Two types of drugs were used on 5 and 7 patients for reducing their weight. Drug A was imported and Drug B was indigenous. The decrease in weight in Kg after using the drugs for Six months was as follows: **[L3,CO4,10M]**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Drug A | 10 | 12 | 13 | 11 | 14 | | |
| Drug B | 8 | 9 | 12 | 14 | 15 | 10 | 9 |

Is there a significant difference in the efficacy of two drugs? If not, which Drugs should you buy? Use 1% level of significance.

**9.** Explain the procedure involved in solving ANOVA problem. **[L2,CO4,10M]**

**10.** To study the performance of three detergents and three different water temperatures, the following whiteness readings were obtained with specially designed equipment. Make the ANOVA for the given data. **[L5,CO4,10M]**

| **Water Temperature** | **A** | **B** | **C** |
|---|---|---|---|
| Cold water | 47 | 45 | 50 |
| warm water | 39 | 42 | 52 |
| Hot water | 44 | 36 | 48 |

## UNIT – V
## NON-PARAMETRIC METHODS

**1.** Using Chi – square ($\chi^2$) test analyse the following data to determine whether the preference pattern of consumers for cellphones is dependent on the income levels. **[L5, CO5, 10M]**

| | Level of income | | | |
|---|---|---|---|---|
| Cell phones | Low | Medium | High | Total |
| Sony | 65 | 90 | 100 | 255 |
| Motorola | 35 | 40 | 80 | 155 |
| Ericson | 50 | 60 | 220 | 330 |
| Total | 150 | 190 | 400 | 740 |

**2.** The following table lists the frequency distribution of cars sold at an auto dealership during the past 10 months. **[L5,CO5,10M]**

| Months | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|
| Cars sold | 23 | 17 | 15 | 10 | 14 | 12 | 13 | 15 | 26 | 25 |

Using the 5% level of significance, will you conclude that the number of cars sold at this dealership is same for each month?

**3.** Write the difference between parametric and non-parametric methods. **[L2,CO5,10M]**

**4.** Describe the sign test. How do you interpret the results of Sign Test. **[L2,CO5,10M]**

**5.** A random sample of size 8 taken from the population is given below: **[L2,CO5,10M]**

19, 18, 11, 9, 13, 15, 17, 13

Test the hypothesis that the population median is 12 using sign test.

**6.** Test the hypothesis that the two samples have taken from identical populations by sign test. **[L5,CO5,10M]**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| X | 45 | 50 | 60 | 52 | 55 | 60 | 78 | 80 | 65 | 62 |
| Y | 40 | 45 | 55 | 50 | 52 | 60 | 55 | 53 | 70 | 65 |

**7.** Describe the procedure involved in conducting chi-square test. **[L3,CO5,10M]**

**8.** Calculate the Chi-square value for the following data of incidences of water-borne diseases in three tropical regions. **[L5,CO5,10M]**

| | India | Equador | South America | Total |
|---|---|---|---|---|
| Typhoid | 31 | 14 | 45 | 90 |
| Cholera | 2 | 5 | 53 | 60 |
| Diarrhoea | 53 | 45 | 2 | 100 |
| | 86 | 64 | 100 | 250 |

**9.** What is non- parametric method? Explain its importance. **[L2,CO5,10M]**

**10.** What are the types of Chi-square test? Explain with examples. **[L1,CO5,10M]**

## CASE STUDIES:

**1.** Compute the missing frequency from the following distribution if its mean is 15.25.

**[L5, CO1, 10M]**

| x | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|
| f | 3 | 7 | ? | 20 | 8 | 5 |

**2.** An incomplete distribution is as follows: **[L5, CO1, 10M]**

Compute the missing frequency, if its median is 46.

| Variable | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 | 70 - 80 | Total |
|---|---|---|---|---|---|---|---|---|
| Frequency | 12 | 30 | - | 65 | - | 25 | 18 | 229 |

**3.** Compute Arithmetic Mean , Geometric Mean, Harmonic Mean of the following discrete series.

**[L5, CO1, 10M]**

| x | 2 | 4 | 8 | 16 |
|---|---|---|---|---|
| f | 2 | 3 | 3 | 2 |

**4.** Calculate the Karl Pearson's Co-efficient of Correlation from the following data:

Comment on the result through the probable error. **[L5, CO2, 10M]**

| X | 6 | 8 | 12 | 15 | 18 | 20 | 28 | 31 |
|---|---|---|---|---|---|---|---|---|
| Y | 10 | 12 | 15 | 15 | 18 | 25 | 26 | 28 |

**5.** From the following data of the age of husband and the age of wife, form two regression equations and calculate the wife's age when husband's age is 25 years.

**[L5, CO2, 10M]**

| Husband's age | 31 | 32 | 35 | 29 | 33 |
|---|---|---|---|---|---|
| wife's age | 23 | 25 | 29 | 21 | 26 |

**Prepared by:**

**KOORAPATI YAMUNA**

**Department of MBA/SIETK.**