2023

B.A./B.Sc.

First Semester

GENERIC ELECTIVE – 1

STATISTICS

Course Code: STG 1.11

(Statistical Methods)

Total Mark: 70 *Pass Mark: 28*

Time: 3 hours

Answer five *questions, taking* one *from each unit.*

UNIT–I

1. (a) Fill in the blank:
The column headings of a table is known as _____. 1
(b) Define complex table. Explain the different categories of complex table. 1+5=6
(c) Discuss the various method of obtaining a secondary data. 7

2. (a) What are class limits? 2
(b) What are graphs? Discuss in detail the different types of graphs. 1+5=6
(c) Discuss the classification of data based on nature of variable. 6

UNIT–II

3. (a) Fill in the blank:
Median = _____ quartile. 1
(b) Define arithmetic mean. Mention some of its merits and demerits. 1+2+2=5
(c) Derive the formula for calculation of arithmetic mean for a grouped continuous series. 4
(d) Explain the graphical method of obtaining median. 4

4. (a) Obtain the relationship between mean, median and mode. 2

(b) Define geometric mean for a frequency distribution. Also, define the formula for a combined geometric mean. 6

(c) Prove that arithmetic mean is greater than a geometric mean and that geometric mean is greater than a harmonic mean. 6

UNIT–III

5. (a) Define the following: 2×2=4
   (i) Quartile deviation (ii) Variance
   (b) Show that the mean deviation is least when measured about the median. 5
   (c) Define range. Give the merits of range. 2+3=5

6. (a) What is meant by measures of dispersion? Explain briefly about absolute and relative measures of dispersion. 2 + 4 = 6
   (b) Show that standard deviation is independent of change of origin but affected by change of scale. 4
   (c) Describe graphical method of detecting skewness. 4

UNIT–IV

7. (a) Define the terms: sample space, events, independent events, exhaustive events and trial respectively. 1×5=5
   (b) State and prove multiplication theorem of probability. 5
   (c) Data on the readership of a certain magazine show that the proportion of male readers under 35 is 0.40 and over 35 is 0.20. If the proportion of readers under 35 is 0.70, find the proportion of subscribers that are females over 35 years. Also, calculate the probability that a randomly selected male subscriber is under 35 years of age. 4

8. (a) Define classical probability and statistical probability. Write their limitations. 2+3=5
   (b) An MBA applies for a job in two firms *X* and *Y*. The probability of him being selected in firm *X* is 0.7 and being rejected at *Y* is 0.5. The probability of at least one of his applications being rejected is 0.6. What is the probability that he will be selected in one of the firms? 4
   (c) Discuss Bayes' probability and give formula for its calculation. 5

UNIT–V

9. (a) Show that for n attributes $A_1, A_2, A_3, \ldots A_n$.
$(A_1, A_2, A_3, \ldots, A_n) \geq (A_1) + (A_2) + (A_3) + \ldots + (A_n) - (n-1)N$
Where N is the total number of observation. 5

(b) What do you mean by consistency of data? Write the conditions of consistency for two attributes A and B. 1+3=4

(c) Given $(AB) = 40$, $(A\beta) = 3$, $(\alpha B) = 33$, $(\alpha\beta) = 12$. Calculate Yule's coefficient of association and comment on its value. 5

10. (a) Define the following: attribute dichotomy, class frequencies and independence of attributes respectively. 4

(b) A student reported the results of survey in the following manner in term of the usual notations:
$N = 1000$, $(A) = 525$, $(B) = 132$, $(C) = 470$, $(AB) = 42$,
$(BC) = 86$, $(AC) = 147$ and $(ABC) = 25$.
Examine the consistency of the above data. 5

(c) Show that symbol $\delta = \frac{1}{N}[(AB)(\alpha\beta) - (A\beta)(\alpha\beta)]$. 5