



Reg. No. :

Name :

First Semester B.Sc. Degree Examination, February 2018

First Degree Programme under CBCSS

COMPLEMENTARY COURSE FOR MATHEMATICS

**ST 1131.1 – Descriptive Statistics and Introduction to Probability
(2014 Admissions Onwards)**

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** the questions, **each** carrying **1** mark.

1. Define primary data.
2. Explain sampling error.
3. Write an example for an ordinal variable.
4. Construct a stem-and-leaf display for the data below.
36, 59, 42, 65, 91, 32, 56, 28, 49, 51, 30, 55, 33, 63, 70, 44, 42, 83, 53, 43.
5. Define a relative measure of dispersion.
6. Describe the sample space in the case of successive tosses of a coin until a head turns up.
7. State the classical definition of probability.
8. Define probability space.
9. When do you say that two events are independent ?
10. How is mean, median and mode related in a positively skewed distribution ?

(1×10=10 Marks)

SECTION – B

Answer **any 8** questions, **each** carrying **2** marks.

11. Explain classification of data.
12. What are the major sources of secondary data ?



13. Represent the following data by a suitable diagram

Items	State A	State B
Agriculture	357	768
Irrigation	492	909
Industry	261	990
Transport	654	1485
Social Services	306	945
Miscellaneous	90	303

14. The class marks in a frequency table are given to be 5, 10, 15, 20, 25, 30, 35, 40, 45 and 50. Write down the classes. What are the considerations one has to bear in mind while forming a frequency distribution ?

15. Explain simple random sampling without replacement.

16. Get an expression for the fourth central moment in terms of raw moments.

17. Define the moment measure of skewness. How will you deduct the type of skewness using this measure ?

18. The standard deviation of a symmetrical distribution is 5. What must be the value of the fourth central moment in order that the distribution is meso kurtic.

19. Explain :

i) mutually exclusive and

ii) exhaustive events.

20. Explain statistical regularity.

21. A, B and C are three events. Find the expression for the following :

i) atleast one occurs

ii) none occurs

22. Given that $P(A \cup B) = \frac{5}{6}$, $P(A \cap B) = \frac{1}{3}$ and $P(B') = \frac{1}{2}$. Determine $P(A)$ and $P(B)$.

(8×2=16 Marks)



SECTION - C

Answer any 6 questions, each carrying 4 marks.

23. Distinguish between census and sampling.
24. Draw a blank table to represent the students of a college according to their
 - i) faculty : Arts, Science, Commerce
 - ii) Age : 16 – 20, 21 – 25 and others
 - iii) Sex : male, female.
25. Three samples of sizes 80, 40 and 30 having means 12.5, 13 and 11 respectively are combined. Find the mean of the combined sample.
26. Define raw moments and central moments. Derive a general expression for the central moments in terms of raw moments.
27. Explain Kurtosis. What are its measures ?
28. State and prove addition theorem of probability for two events. Deduce the same for three events.
29. Explain pairwise independence and mutual independence of events. If A and B are two independent events, show that A^c and B^c are also independent.
30. Given $P(A) = P(B) = P(C) = 0.4$; $P(AB) = P(AC) = P(BC) = 0.2$ and $P(ABC) = 0.1$ find the probabilities of
 - i) atleast one of the events
 - ii) exactly one of the events
 - iii) exactly two of the events.
31. State and prove Bayes' Theorem.

(6×4=24 Marks)



SECTION – D

Answer any 2 questions, each carrying 15 marks.

32. Construct a histogram and frequency polygon for the following data.

Class interval :	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39
frequency :	8	15	18	30	16	12	6

Draw an ogive and estimate the median and quartile deviation.

33. Lives of two models of refrigerators turned in for new models are

Life (No. of years)	Model A	Model B
0 – 2	5	2
2 – 4	16	7
4 – 6	13	12
6 – 8	7	19
8 – 10	5	9
10 – 12	4	1

What is the average life of each model of these refrigerators? Which model shows more uniformity?

34. Define conditional probability. State and prove multiplication theorem. When do you say that two events are independent?

35. The odds against Manager X settling the wage dispute with the workers are 8 : 6 and odds in favour of Manager Y settling the same dispute are 14 : 16

i) What is the chance that neither settles the dispute, if they both try independently of each other?

ii) What is the probability that the dispute will be settled?

(2×15=30 Marks)