Reg. No. : ....

Name : ....

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme under CBCSS

Statistic

Complementary Course for Mathematics

ST 1131.1 : DESCRIPTIVE STATISTICS AND INTRODUCTION TO PROBABILITY

(2014–2017 Admission)

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　Max. Marks : 80

Instructions:　Use of scientific calculator is permitted

SECTION – A

Answer **all** questions. **Each** question carries **1** mark.

1.　What is a questionnaire?

2.　What are the main functions of statistics?

3.　The arithmetic mean of the numbers 1,2, ..., n is ....

4.　What is a frequency distribution?

5.　Define the term population.

6.　If the sum of N observations is 630 and their mean is 42, find the value of N.

7.　The probability of throwing an odd sum with fair dice is ——————

8.　Define kurtosis.

9. If A two events A and B are such that $A \subset B$ and $B \subset A$, the relation between $P(A)$ and $P(B)$ is ───────

10. If A is an event, the conditional probability of A given A is equal to ───────

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions. **Each** question carries **2** marks.

11. What are different sources of primary data?

12. Give different methods of collection of data.

13. The mean and median of 100 items are 50 and 52 respectively. The value of the largest item is 100. It was later found that it is actually 110. Find the true mean and true median.

14. Define coefficient of variation and state its use.

15. In a moderately assymmetrical distribution mode is 48.4 and median is 41.6. Find the value of the mean.

16. Construct a stem-and-leaf plot for the following set of data.

28, 13, 26, 12, 20, 14, 21, 16, 17, 22, 17, 25, 13, 30, 13, 22, 15, 21,

18, 18

16, 21, 18, 31, 15, 19

17. Suppose that the universal set S is defined as $S = \{1,2,...,10$ and $A = \{1,2,3\}, B = \{X \in S : 2 \le X \le 7\}$ and $C = \{7,8,9,10\}$. Find (i) Find $A \cup B$ (ii) Find $(AUC) - B$

18. How does standard deviation is affected by the change of origin and scale?

19. What is the probability of drawing a king and a queen consecutively from a deck of 52 cards, without replacement?

20. What is the probability of getting a sum of 9 when two dice are thrown?

21. Prove that $P(A \cap B) = P(A)P(B)$ if A and B are independent.

22. What do you mean by statistical regularity?

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. **Each** question carries **4** marks.

23. Explain different types of scales in statistics.

24. In what situations sampling is inevitable?

25. Draw the histogram and frequency curve for the following data:

Monthly wages (in Rs) :	11-13	13-15	15-17	17-19	19-21	21-23	23-25
No. of workers :	6	53	85	56	21	16	8

26. Calculate geometric mean of the following data:

Classes :	1-3	4-6	7-9	10-12
Frequency :	8	16	15	3

27. Distinguish between absolute measure and relative measures of dispersion

28. Explain skewness and give two measures of skewness.

29. A purse contains 2 silver coins and 4 copper coins and a second purse contains 4 silver coins and 3 copper coins. If a coin is selected at random from one of the purse. What is the probability that it is a silver coin?

30. Prove or disprove pairwise independence implies mutual independence.

31. Given A, B, C are independent events, $P(A) = 0.6$, $P(B) = 0.2$, $P(C) = 0.7$, find the probability for:

    (a) All occurring

    (b) At least one occurring

$(6 \times 4 = 24$ **Marks**$)$

SECTION – D

Answer any **two** questions. **Each** carries **15** marks.

32. Following is a cumulative frequency distribution showing the marks secured and the number of students m an examination:

Marks	No. of students (F)
Below 10	12
20	30

3

30	60
40	100
50	150
60	190
70	220
80	240
90	250

Obtain the frequency table (simple) from it. Also prepare 'More than' cumulative frequency table.

33. Calculate the mean and standard deviation for the following table giving the age distribution of 542 members.

Age (in years) :	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of members :	3	61	132	153	140	51	2

34. Calculate the first four moments about the mean for the following data and hence find $\beta_1, \beta_2, \gamma_1$ and γ_2

x :	1	2	3	4	5	6	7	8	9
f :	1	6	13	25	30	22	9	5	2

35. (a) State and prove Baye's theorem.

(b) Among the applicants to a post 70 % are males and the rest are females. While 50% of the male applicants are MBA holders and only 40% of the female applicants are MBA holders. If a MBA holder is selected to the post, what is the probability that the selected candidate is a female?

(2 × 15 = 30 Marks)

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