1B1N22312 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Psychology Degree Examination, November 2022

BST1C05 – Descriptive Statistics

(2022 Admission onwards)

Time : 2 hours Max. Marks : 60

SECTION-A

Each question carries 2 Marks.
Maximum Marks that can be scored in this section is 20.

1. What is meant by data?
2. Name any four methods of collecting primary data.
3. Give the classification of data based on its nature.
4. What is a bar diagram?
5. What is meant by working class? Give example.
6. Name any four methods of graphical representation of data.
7. Define harmonic mean.
8. Obtain the median of 15, 4, 37, 28, 9, 17, 61, 42, 21, 13
9. What is meant by mean deviation about median?
10. What is meant by relative measure of dispersion? Name them.
11. For a distribution with mean = 15, median = 12 and mode = 10. Comment on the skewness of the distribution.
12. Define kurtosis.

SECTION-B

Each question carries 5 Marks.
Maximum Marks that can be scored in this section is 30.

13. Define secondary data. Explain the methods for collecting it.
14. Differentiate between questionnaires and schedules.
15. Draw a frequency polygon for the following data using a histogram.

Weekly wages:	0-10	10-20	20-30	30-40	40-50
f:	3	12	20	10	5

16. Calculate the mode for the following data.

Mid x:	5	10	15	20	25	30	35
Frequency:	18	29	46	62	51	14	10

17. What are the desirable characteristic of a good average?

18. Calculate standard deviation for 23, 25, 28, 31, 34, 38, 40, 42, 46.

19. Distinguish between positive and negative skewness.

SECTION-C
(Answer *any one* Question and carries 10 marks)

20. Draw less than and greater than ogives for the following data and determine median.

Mark	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students	2	3	5	14	20	30	15	9

21. Distinguish between absolute and relative measures of dispersion. Explain various absolute and relative measures of dispersion.

 Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Statistics Degree Examination, November 2022

BST1B01 – Official Statistics & Probability

(2022 Admission onwards)

Time : 2 ½ hours Max. Marks : 80

PART A
All questions can be attended
(Each question carries 2 marks)

1. What are the statistical organizations functioning in India?
2. Write short note on frequency polygon.
3. What is a sample.
4. Define qualitative and quantitative data.
5. Define ogive.
6. Determine the mode of 420, 395, 342, 444, 551, 395, 425, 417, 395, 401, 390.
7. State the desirable properties of a measure of dispersion.
8. Obtain the standard deviation of the first n natural numbers.
9. What are the different types of Kurtosis?
10. What is the principle of least square?
11. Karl Pearson's coefficient of correlation between two variables X and Y is 0.28 and their covariance is 7.6. If the variance of X is 9, find the standard deviation of Y series.
12. Define multiple correlation.
13. Using the frequency definition of probability verify the empirical validity of the statement $P(A) = 1 - P(A^c)$.
14. State addition theorem of probability.
15. Define pairwise independence and mutual independence.

Ceiling – 25 marks

PART B
All questions can be attended
(Each question carries 5 marks)

16. Explain the responsibilities of CSO.
17. Explain various types of bar diagrams.
18. The mean age of a combined group of men and women is 33 years. It is given that the average age of men is 42 and the average age of women is 27. Find the percentage of men and women in the group.
19. Explain mean deviation. Show that mean deviation about median is a minimum.

20. For the data given below, find the equation to the best fitting exponential curve of the form $y = ab^x$.

x	1	2	3	4	5	6	7	8
y	1	1.2	1.8	2.5	3.6	4.7	6.6	9.1

21. Obtain the angle between two lines of regression

22. Give the axiomatic definition of probability. Use the axioms of probability to show that $P(A) \leq P(B)$ whenever A is a subset of B.

23. A basket contains 20 bad oranges and 80 good oranges. Three oranges are taken from the basket. Find the probability that out of them (a) at least two (b) exactly two (c) at most two are good oranges.

Ceiling – 35 marks

PART C

Each question carries 10 marks (Answer any TWO questions)

24. Draw the cumulative frequency curve and histogram for the following distribution showing the number of marks of 59 students in Statistics. And hence obtain the median, Q_1 and Q_3.

Marks → group	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of students	4	8	11	15	12	6	3

25. (a) What are the usual measures of dispersion? Point out their advantages and disadvantages.

(b) The scores of two teams in a match are given below. Find which team is more consistent in their play.

Team A	32	38	39	47	48	50	62
Team B	31	34	48	40	48	53	55

26. Obtain the rank correlation coefficient for the following data:

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

27. In a class with 50 students 10 comes to college by car, 20 comes by two wheelers and the rest by foot. The chances of these students to reach college late are respectively 0.1, 0.15 and 0.05. One day a student came late. What is the probability that he is the student using car to reach college?

1B1N22319 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Statistics Degree Examination, November 2022

BST1B01 – Official Statistics & Probability

(2022 Admission onwards)

Time : 2 ½ hours Max. Marks : 80

PART A
All questions can be attended
(Each question carries 2 marks)

1. What are the statistical organizations functioning in India?
2. Write short note on frequency polygon.
3. What is a sample.
4. Define qualitative and quantitative data.
5. Define ogive.
6. Determine the mode of 420, 395, 342, 444, 551, 395, 425, 417, 395, 401, 390.
7. State the desirable properties of a measure of dispersion.
8. Obtain the standard deviation of the first n natural numbers.
9. What are the different types of Kurtosis?
10. What is the principle of least square?
11. Karl Pearson's coefficient of correlation between two variables X and Y is 0.28 and their covariance is 7.6. If the variance of X is 9, find the standard deviation of Y series.
12. Define multiple correlation.
13. Using the frequency definition of probability verify the empirical validity of the statement $P(A) = 1 - P(A^c)$.
14. State addition theorem of probability.
15. Define pairwise independence and mutual independence.

Ceiling – 25 marks

PART B
All questions can be attended
(Each question carries 5 marks)

16. Explain the responsibilities of CSO.
17. Explain various types of bar diagrams.
18. The mean age of a combined group of men and women is 33 years. It is given that the average age of men is 42 and the average age of women is 27. Find the percentage of men and women in the group.
19. Explain mean deviation. Show that mean deviation about median is a minimum.

20. For the data given below, find the equation to the best fitting exponential curve of the form $y = ab^x$.

x	1	2	3	4	5	6	7	8
y	1	1.2	1.8	2.5	3.6	4.7	6.6	9.1

21. Obtain the angle between two lines of regression

22. Give the axiomatic definition of probability. Use the axioms of probability to show that $P(A) \leq P(B)$ whenever A is a subset of B.

23. A basket contains 20 bad oranges and 80 good oranges. Three oranges are taken from the basket. Find the probability that out of them (a) at least two (b) exactly two (c) at most two are good oranges.

Ceiling – 35 marks

PART C

Each question carries 10 marks (Answer any TWO questions)

24. Draw the cumulative frequency curve and histogram for the following distribution showing the number of marks of 59 students in Statistics. And hence obtain the median, Q_1 and Q_3.

Marks – group	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of students	4	8	11	15	12	6	3

25. (a) What are the usual measures of dispersion? Point out their advantages and disadvantages.

(b) The scores of two teams in a match are given below. Find which team is more consistent in their play.

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26. Obtain the rank correlation coefficient for the following data:

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

27. In a class with 50 students 10 comes to college by car, 20 comes by two wheelers and the rest by foot. The chances of these students to reach college late are respectively 0.1, 0.15 and 0.05. One day a student came late. What is the probability that he is the student using car to reach college?

1B1N22320 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Mathematics Degree Examination, November 2022

BST1C01 – Introductory Statistics

(2022 Admission onwards)

Time : 2 hours Max. Marks : 60

Part A

Each question carries 2 Marks.

Maximum Marks that can be scored in this Part is 20

1. Write any four responsibilities of NSSO
2. What is the difference between nominal and ordinal data?
3. Write any two merits and demerits of Geometric mean.
4. Define Quartiles and Deciles.
5. What is the difference between absolute and relative measures of dispersion?
6. Calculate combined mean for the following data.

Set	Number of articles	Mean
1	200	5
2	250	10
3	500	15

7. What is the variance of a set of values with mean and coefficient of variation are respectively 20 and 60%?
8. Define correlation and write any two properties of correlation.
9. Define curve fitting and principle of least squares.
10. Why Fisher index number is called ideal index number? What are the formulae for Fisher index number?
11. Define seasonal variation and cyclical variation.
12. For a distribution third quartile is 178, first quartile is 142 and the median is 160.Find Bowley's coefficient of skewness?

Part B

Each question carries 5 Marks.

Maximum Marks that can be scored in this Part is 30

13 Write a short note on the statistical system in India.

14. Distinguish between histogram and frequency polygon.

15 Which series is more consistent?

Series A: 25 50 45 30 70

Series B: 10 70 50 20 95

16. Define raw moment and central moment and express central moments in terms of the raw moments of order r or less.

17. Fit a straight line for the following data.

X:	2	3	5	8	10
Y:	5	6	10	18	21

18 Derive an expression for rank correlation coefficient.

19. Explain the method of moving averages and semi average method for estimating the secular trend.

Part C

Answer any one question and carries 10 Marks.

20. Find (a) Laspyre's (b) Paasche's and (c)Fisher's index number for the following data.

Commodities	Base year		Current year	
	Price	Quantity	Price	Quantity
A	10	12	12	15
B	7	15	5	20
C	5	24	9	20
D	16	5	14	5

21. Calculate β_1 and β_2 for the following data

Comment on the type of distribution.

X:	1	2	3	4	5	6	7	8	9
Y:	1	6	13	25	30	22	9	5	2

1B1N22321 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Statistics Degree Examination, November 2022

BAS1C01 – Financial Mathematics

(2022 Admission onwards)

Time : 2 hours Max. Marks : 60

PART- A (Short Answer)
Each question carries Two marks. Maximum 20 Marks

1. Distinguish between Simple and Compound rate of discount
2. Calculate the present value of £10,000 due at time 3 years, using a compound discount rate of 5% pa.
3. Calculate the present value of an annuity that pays £300 pa monthly in arrears forever using an annual effective rate of interest of 6%.
4. Given $\delta = 8\%$, calculate
   a) $i^{(4)}$
   b) d
5. Explain the prospective method for loan calculation
6. Find the value of d, if $d^{(4)} = 8\%$
7. Given that I = 15, R=35, i=7.5% and n=10, calculate the value of P
8. Define a pure endowment contract
9. Calculate the present value of payments of £10 at time 0, £20 at time 1 year, £30 at time 2 years and so on. The last payment is at time 10 years. Assume that the annual effective rate of interest is 4.2%.
10. Explain the term "Inflation"
11. Derive the relationship between i and δ
12. Calculate the rate of interest convertible monthly corresponding to an effective rate of interest of 14.2% pa

PART- B (Paragraph)
Each question carries Five marks. Maximum 30 Marks

13. Given an investment of €1,000, calculate the accumulation after 5 years using:
    a) Simple discount of 8% pa
    b) Compound discount of 8% pa
    c) Compound interest of 8% pa.

14. The force of interest $\delta(t)$ at time t is given by

    0.08 for $0 \leq t < 5$

    $0.13 - 0.01t$ for $t \leq 5$

    Calculate the Accumulated value at time 10 of an investment of \$500 at time 2

15. Derive the equation for a_n

16. Calculate the effective annual rate of interest corresponding to:

    (a) A nominal rate of interest of 11% pa convertible half-yearly

    (b) A nominal rate of interest of 12% pa convertible monthly.

    (c)A nominal rate of interest of 11% pa convertible three times a year.

17. Calculate the total present value as at 1 September 2022 of payments of £280 due on 1 September 2024 and £360 due on 1 March 2025, assuming the interest rate is 15% pa effective.

18. A loan of \$50,000 is repayable by level annual payments at the end of each of the next 5 years. Interest is 8% pa effective for the first three years and 12% pa effective thereafter. Calculate the loan outstanding immediately after the second repayment.

19. A man borrows £7,500 to buy a car. He repays the loan by 24 monthly instalments of £368.75, payable in arrears. Calculate the APR on this transaction

PART- C (Essay)

Each question carries Ten marks. Maximum 10 Marks

20. X denotes the present value of an annuity consisting of payments of £2,000 payable at the end of each of the next 8 years, valued using an interest rate of 8% pa convertible quarterly. Y denotes the present value of an annuity consisting of payments of £4,000 payable at the end of every fourth year for the next 16 years, valued using an interest rate of 8% pa convertible half-yearly. Calculate the ratio X /Y

21. A bank lends a company £15,000 at a fixed rate of interest of 12% pa effective. The loan is to be repaid by 10 level annual payments. Calculate the interest and capital payments of each level repayment.