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1B1N240159 (Pages : 3) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2024

ACT1MN101(P) – Actuarial Mathematics 1

(FYUGP 2024 Admission)

Time: 2 hours Max. Marks : 70

Course Outcome Mapping Scheme

1	2	3	4	5	6	7	8	9	10
CO1	CO1	CO1	CO2	CO2	CO2	CO3	CO3	CO4	CO5
11	12	13	14	15	16	17	18	19	20
CO2	CO5	CO4	CO5	CO1	CO1	CO3	CO5	CO3	CO4

(Use of Scientific calculators are permitted)

Section A

[Answer all. Each question carries 3 marks] (Ceiling: 24 Marks)

1. Define zero-coupon bond.
2. What do you mean by a security?
3. What is meant by an interest only loan?
4. An investor deposits £200000 in a bank account that pays simple interest at a rate of 6% pa.Calculate the accumulated value of the deposit after 5 years.
5. Calculate the length of time it will take £800 to accumulate to £1,000 at a compound rate of interestof 4% pa.
6. Calculate the effective annual interest rate that is equivalent to a simple interest rate of 5% pa over 6 years.
7. If i=5%, calculate $d^{(12)}$
8. 2500 is invested in an account that pays nominal interest of 6% pa convertible half-yearly. Calculate the accumulated amount in the account after 5 years.
9. Define immediate annuity.
10. Define equation of value.

Section B

[Answer all. Each question carries 6 marks] **(Ceiling: 36 Marks)**

11. Define force of interest. Assuming a force of interest of 8% pa, calculate the accumulated value of £500 after:

    (i) 5 months

    (ii) 5 years

    (iii) 8 years and 12 days.

12. Explain the following:

    a) Principle of consistency b) Present values

13. Derive an expression for the present value of an annuity, where payments are made:

    a) in arrear b) in advance

14. A 182-day treasury bill, redeemable at $100, was purchased for $96.50 at the time of issue and later sold to another investor for $98 who held the bill to maturity. The rate of return received by the initial purchaser was 4% per annum effective.

    (i) Calculate the length of time in days for which the initial purchaser held the bill.

    (ii) Calculate the annual simple rate of return achieved by the second investor.

    (iii) Calculate the annual effective rate of return achieved by the second investor.

15. Discuss the following:

    a) An equity b) An annuity certain

16. Briefly explain about a fixed interest security.

17. a) Distinguish between simple discount and compound discount.

    b) Calculate the present value of £25,000 due at time 4 years, using a compound discount rate of 4.5% pa.

18. a) Calculate P , given that D = 5 , R =125 , i=10% and n =10 .

    b) Calculate n , given that P = 83.73 , D = 4 , R =101 and i= 6% .

Section C

[Answer any one. Each question carries 10 marks] **(1x10= 10 Marks)**

19. a) Complete the following table:

		Value of :			
		δ	i	v	d
in terms of...	δ				
	i				
	v				
	d				

b) Distinguish between nominal rate of interest and nominal rate of discount.

c) £250 is invested at a discount rate of 18% pa convertible monthly for the first 3 months followedby an interest rate of 20% pa convertible quarterly for the next 9 months. Calculate theaccumulated sum at the end of the year.

20. Explain the following:

a) Deferred annuities

b) Continuously payable annuities

c) Perpetuities

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2024

STA1CJ101 – Univariate Data Analysis

(FYUGP 2024 Admission)

Time: 2 hours Max. Marks : 70

Course Outcome Mapping Scheme

1	2	3	4	5	6	7	8	9	10
CO1	CO1	CO2	CO2	CO3	CO3	CO3	CO4	CO4	CO4
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CO1	CO2	CO2	CO2	CO3	CO3	CO5	CO4	CO2	CO3

(Use of scientific calculator is permitted)

PART – A
All questions can be attended.
Each question carries Three marks.
Ceiling -24 Marks

1. Distinguish between qualitative and quantitative data. Provide examples.
2. Define primary and secondary data with examples.
3. Compare mean and median as measures of central tendency.
4. If there are only two observations, show that $GM^2 = AM \times HM$.
5. Explain the concept of standard deviation.
6. Define raw moments and central moments.
7. Write down the measure of kurtosis based on moments.
8. Explain R as a statistical software and programming language.
9. Write down the applications of R.
10. Write any three comparison operators used in R.

PART – B

All questions can be attended.
Each question carries six marks.
Ceiling -36 Marks

11. Describe the process of designing a questionnaire? What are the key considerations in questionnaire design?
12. A cyclist pedals from his house to his college at a speed of 10 km.p.h. and back from the college to his house at 15km.p.h. Compute the average speed.
13. Calculate the missing frequency from the following frequency distribution of daily sales of shops, given that the medium sale of shops is Rs. 24.

Sales	0-10	10-20	20-30	30-40	40-50
No of shops	5	25	-	18	7

14. Calculate mode for the following data

Class	0-9	10-19	20-29	30-39	40-49	50-59
Frequency	5	10	17	33	22	13

15. Calculate Coefficient of Variation for the following data

    1, 2, 3, 4, 5, 6, 7, 8, 9 and 10.

16. Calculate Quartile measure of skewness for the following data.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	8	15	24	21	12

17. Construct a box plot for the dataset: 20, 12, 30, 15, 35, 50, and 10.
18. Describe any five built-in functions in R.

PART - C

Answer any *one* question.
Each question carries Ten marks.

19. Calculate Q_3, D_4, D_7, P_{30} and P_{65} for the following data.

Class	0-8	8-16	16-24	24-32	32-40	40-48
Frequency	6	10	16	13	9	6

20. Calculate the first four central moments for the following data.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	4	13	15	26	22

(1 x 10 = 10 Marks)

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Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2024

STA1FM102 – Fundamentals of Statistics

(FYUGP 2024 Admission)

Time: 1.5 hours Max. Marks : 50

Course Outcome Mapping Scheme

1	2	3	4	5	6	7	8	9	10
CO1	CO1	CO2	CO2	CO3	CO2	CO4	CO4	CO5	CO5
11	**12**	**13**	**14**	**15**	**16**	**17**			
CO1	CO4	CO2	CO4	CO5	CO4	CO3			

Section A
All questions can be attended. Each questions carries 2 marks
(Ceiling:16 Marks)

1. Define Statistics.
2. Differentiate between population and sample?
3. How geographical classification differ from chronological classification?
4. Distinguish between nominal and ordinal scale.
5. What is a pictogram?
6. Distinguish between quantitative and qualitative data.
7. Define measures of central tendency.
8. Define standard deviation.
9. What is leptokurtic curve?
10. Explain Karl Pearson's coefficient of skewness.

Section B
All questions can be attended. Each questions carries 6 marks
(Ceiling:24 Marks)

11. Explain the limitations of statistics.
12. Find arithmetic mean and harmonic mean for the following data.

X	60	48	55	72	45
f	2	1	3	4	2

13. Construct a rough table and explain its important parts.

14. Calculate geometric mean of the following data.

classes	1-3	4-6	7-9	10-12
frequency	8	16	15	3

15. Define partition value. Describe how to find quartiles.

Section C
Answer any one. Each question carries 10 marks

16. i) Describe how to find median in raw data and frequency data.

ii)Compute median for the following data.

classes	0-10	10-20	20-30	30-40	40-50	50-60
frequency	5	15	40	32	20	8

17. i)Describe the steps in constructing a pie diagram.

ii)Construct a multiple bar diagram for the following data of agricultural production in tons.

Year	Paddy	Maize	Wheat
2020	66	35	15
2021	32	12	40
2022	60	20	50

(1×10=10 Marks)

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Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2024

STA1MN101(P) – Descriptive Statistics for Data Science

(FYUGP 2024 Admission)

Time: 2 hours Max. Marks : 70

Course Outcome Mapping Scheme

1	2	3	4	5	6	7	8	9	10
CO1	CO2	CO2	CO4	CO4	CO4	CO4	CO5	CO5	CO5
11	12	13	14	15	16	17	18	19	20
CO1	CO1	CO3	CO3	CO4	CO4	CO5	CO5	CO5	CO4

PART – A
All questions can be attended.
Each question carries Three mark.
Ceiling -24 Marks

1. Distinguish between nominal and ordinal data. Provide examples illustrating their differences.
2. In what way is graphical or diagrammatic representation of data superior to tabular presentation?
3. Differentiate between histogram and bar diagram.
4. Write any three drawbacks of arithmetic mean.
5. Compare Deciles and Percentiles.
6. Explain the concepts of geometric mean and harmonic mean.
7. What are the desirable properties of an average?
8. A card is drawn at random from a ordinary pack of 52 cards. Find the probability that the card drawn is either spade or diamond.
9. What are the limitations of classical definition of probability?
10. Define frequency definition of probability

PART – B
All questions can be attended.
Each question carries six marks.
Ceiling -36 Marks

11. Differentiate between qualitative and quantitative data.
12 Explain the methods of collecting primary data.

13 Represent the adjoining distribution of marks of 100 students in the examination by a histogram.

Marks obtained	No of students
Less than 10	4
" " 20	6
" " 30	24
" " 40	46
" " 50	67
" " 60	86
" " 70	96
" " 80	99
" " 90	100

14. The data below give the yearly profits (in thousands of rupees) of two companies A & B ,

Year	Company A	Company B
1994-95	120	90
1995-96	135	95
1996-97	140	108
1997-98	160	120
1998-99	175	130

Represent the data by means of a multiple bar diagram.

15. Discuss the calculation and interpretation of the median and mode. Provide scenarios where each measure is appropriate.

16 Calculate mean deviation about mean of the following data:

Marks	5	15	20	25	35
No, of students	6	9	12	3	10

17 i) Define Axiomatic definition of probability.

ii)The probability that a student passes statistics test is 2/3 and the probability that he passes both statistics and Mathematics test is 14/45. The probability that he passes at least one test is 4/5. What is the probability that he passes Mathematics test ?

18 Compare Conditional probability and Bayes theorem.

PART - C

Answer any *one* question. Each question carries Ten marks.

19 i) State and prove addition theorem of probability for two events.

ii) A problem in statistics is given to 3 students A, B and C whose chances of solving it are 1/2, 3/4 and 1/4 respectively. What is the probability that the problem will be solved ?

20 . Calculate mean, median and mode for the following data.

Value	10	15	20	25	35
Frequency	2	8	6	3	2

(1 x 10 = 10 Marks)

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1B1N240161 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2024

STA1MN105(P) – Descriptive Statistics

(FYUGP 2024 Admission)

Time: 2 hours Max. Marks : 70

Course Outcome Mapping Scheme

1	2	3	4	5	6	7	8	9	10
CO1	CO1	CO1	CO2	CO2	CO2	CO3	CO3	CO4	CO3
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CO1	CO2	CO2	CO1	CO3	CO3	CO4	CO4	CO3	CO4

PART A
All questions can be attended. Each questions carries 3 marks
(Ceiling:24 Marks)

1. Distinguish between quantitative and qualitative data.
2. Define population and sample.
3. List out the various sources of secondary data.
4. Explain class mark and class width.
5. Define pictogram.
6. Differentiate between geographical and chronological classification.
7. Define measure of central tendency. List out the various measures of central tendency
8. Write down any three desirable properties of ideal measures of central tendency
9. What are the relative measures of dispersion?
10. Define Range and Quartile deviation.

PART B
All questions can be attended. Each questions carries 6 marks
(Ceiling:36 Marks)

11. Explain the merits and demerits of sampling method.
12. Explain the different steps in the construction of a frequency table for a continuous data.
13. Construct a bar diagram using the following data.

year	2005	2006	2007	2008	2009
Sales in lakhs	50	65	43	72	80

14. Explain questionnaire and schedule and also point out their main differences.

15. Calculate geometric mean and harmonic mean for the following data.

value	5	15	25	35	45
Frequency	8	11	9	6	4

16. Calculate mode for the following data.

Class	0-10	10-20	20-30	30-40	40-50
frequency	6	16	26	12	24

17. The runs scored by two batsmen in 5 innings are given below. Calculate Coefficient of variation for each and compare which batsman is more consistent.

Arun : 20 40 55 12 60

Ramesh : 18 60 63 25 102

18. Describe how to find quartile deviation and its coefficient using the following data-

500, 100, 360, 600, 150, 671, 200, 490, 250.

PARTC

Answer any one. Each questions carries 10 marks

19 i)Define median. How is it calculated for various types of data?

ii)Compute median for the following data.

classes	0-7	8-15	16-23	24-31	32-39
frequency	5	10	15	12	8

20. Calculate mean, standard deviation and coefficient of variation for the following data

class	0-6	6-12	12-18	18-24	24-30
frequency	5	12	30	10	3

(1×10=10 Marks)

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Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2024

STA1MN110 (P) – Basic Statistics and Data Visualization

(FYUGP 2024 Admission)

Time: 2 hours Max. Marks : 70

Course Outcome Mapping Scheme

1	2	3	4	5	6	7	8	9	10
CO7	CO1	CO4	CO3	CO4	CO7	CO7	CO1	CO8	CO1
11	12	13	14	15	16	17	18	19	20
CO2	CO7	CO7	CO9	CO7	CO9	CO3	CO8	CO7	CO9

PART – A
All questions can be attended.
Each question carries 3 marks
(Ceiling -24 Marks)

1. Define the term median.
2. Differentiate between population and sample.
3. What is range?
4. What is meant by exclusive class?
5. Explain the concept of quartiles and percentiles.
6. Write the empirical relationship between mean, median and mode.
7. Calculate GM of 2, 4, 6 , 8
8. What is secondary data.
9. Define quality and explain its relationship between variability.
10. Distinguish between primary and secondary data.

PART – B
All questions can be attended.
Each question carries 6 marks.
(Ceiling -36 Marks)

11. Distinguish between qualitative and quantitative date with example.
12. For the following data, calculate the mean deviation from median

X	10	12	14	16	18	20
F	5	6	6	4	3	2

13. Define geometric mean and harmonic mean. Find the GM and HM for the following data:

x	4	6	8	10	12
F	3	5	6	2	4

14. Explain the two types of control chart for attributes.

15. What are the desirable characteristics of average?

16. Explain chance causes of variation and assignable causes of variation.

17. Draw the less than ogive for the following data

Marks scored	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
No of Students	4	8	10	13	12	14	11	8

18. Defne product control and process control.

PART - C

Answer any *one* question

Each question carries Ten marks.

19. Construct a control chart for mean and range for the following data on the basis of bulbs, samples of 5 being taken for 10 days in a month. Comment on whether the production seems to be under control.

Values for 10 samples									
1	2	3	4	5	6	7	8	9	10
61	78	28	137	36	49	59	60	81	78
78	103	30	83	54	89	19	36	136	90
136	49	70	56	84	81	59	87	81	78
109	113	52	79	77	98	118	27	42	94
94	93	37	80	69	109	62	95	60	15

20. Compute the mode and median for the following data:

Class	10-14	14-18	18-22	22-26	26-30
Frequency	20	30	11	3	5

1 x 10 = 10 Marks