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1B1N19100 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Statistics Degree Examination, November 2019

BST1B01 – Official Statistics & Probability

(2019 Admission onwards)

Time: 2 ½ hours Max. Marks : 80

Part A.
Each question carries 2 marks

1. Define Geometric mean
2. Define distribution function of a random variable.
3. Given P(A)=0.30, P(B)=0.78 and P(A∩B)=0.16 find $P(A^c \cap B^c)$
4. Define Conditional probability.
5. If the coefficient of variation of a distribution is 50 and its variance is 400. What will be the value of arithmetic mean?
6. Given $r_{12}=0.60$, $r_{13}=0.51$, $r_{23}=0.40$ find $r_{12.3}$
7. Define Random experiment. Give example.
8. A continuous random variable X has pdf $f(x) = kx$,$0 < x < 1$ the value of k is?
9. What are the four divisions of NSSO?
10. Write about the publications of CSO.
11. Define Kurtosis. Write the moment measure of it.
12. Write the classical definition of probability.
13. Calculate Harmonic mean of 100,200,300,400
14. Explain scatter diagram
15. Explain the graphical determination of median.

(Maximum Marks=25)

Part B.
Each question carries 5 marks

16. Prove for any discrete distribution, standard deviation is not less than mean deviation from the mean.
17. State and prove Baye's theorem.
18. State and prove addition theorem for two events.
19. A random variable has density $f(x) = k\,x^2 e^{-x^3}$, $x > 0$. Determine k and the density of $y=x^3$.
20. Give notes on statistical system in Centre and state and its functions.

21. Prove that pair wise independence does not imply mutual independence

22. Explain the absolute and relative measures of dispersion

23. Calculate the Standard deviation of the following data

x :	10	12	14	16	18
f :	2	4	6	8	10

(Maximum Marks=35)

Part C

Each question carries 10 marks. (Answer any Two Questions)

24. (a) Prove that for n events $A_1, A_2, \ldots, A_n$

(i) $P(\cap_{i=1}^{n} A_i) \geq \sum_{i=1}^{n} P(A_i) - (n-1)$

(ii) $P(\cup_{i=1}^{n} A_i) \leq \sum_{i=1}^{n} P(A_i)$

(b) A husband and wife appear in an interview for two vacancies in a firm the probability of husband's selection is 1/7 and that of wife's selection is 1/5. What is the probability that

1. Both of them will be selected
2. Only one of them will be selected

25. The heights in inches (x) and weights in lbs (y) of 10 college students are given below:

x:	70	64	72	67	65	69	70	62	72	66
y:	181	125	178	160	139	145	165	126	180	132

Calculate (i) The correlation coefficient

(ii) The regression of y on x.

26. Fit a parabola $y = a + bx + cx^2$ to the following data

x:	1	2	3	4	5	6	7
y:	2.3	5.2	9.7	16.5	29.4	35.5	54.4

27. Calculate Mean and Mode. Determine median using the empirical relation

Class:	0-5	5-10	10-15	15-20	20-25	25-30
Frequency:	4	8	14	6	5	3

(2x10=20 Marks)

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19093 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2019

BST1C05 – Descriptive Statistics

(2019 Admission onwards)

2 hours Max. Marks : 60

SECTION-A

Each question carries 2 Marks.

Maximum Marks that can be scored in this section is 20.

1. Distinguish between primary and secondary data.
2. What do you mean statistical population? Give an example.
3. Explain the method of construction of pie diagram.
4. What is the purpose of classification of data?
5. Establish a relationship between A.M, G.M, and H.M.
6. Calculate the G.M of the observations 2, 4, 16.
7. Mean of 100 observations is 50 and S.D is 10. What will be the new mean and S.D if 5 is subtracted from each observation and then it is devided by 4?
8. Distinguish between absolute and relative measures of disperson. Give one example for each.
9. For a certain data, variance is 36 and C.V is 5. Find the mean.
10. Discuss the merits and demerits of mean deviation.
11. Find the C.V of a frequency distribution given that its mean is 120, mode is 123 and Karl Pearson's Coefficient of skewness is -0.3.
12. What do you understand by skewness of a distribution?

SECTION-B

Each question carries 5 Marks.

Maximum Marks that can be scored in this section is 30.

13. Explain the different types of classification.
14. Briefly explain the various diagrams used for the presentation of a statistical data.

15. Draw the less than ogive for the following data and estimate the percentage of items having values (i) less than 45 (ii) more than 55

Class	0-9	10-19	20-29	30-39	40-49	50-59	60-69
Frequency	4	12	17	28	15	9	5

16. Calculate median and mode for the following data.

Class	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59
Frequency	5	10	15	30	5	5

17. Calculate M.D about mean for the following data

Class	0 - 2	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12
Frequency	5	16	13	7	5	4

18. What are the desirable properties of a good measure of central tendency?

19. The mean weight of 150 students in a certain class is 60 kg. The mean weight of boys in class is 70kg. and that of girls is 55kg. Find the number of boys and girls in the class.

SECTION-C

(Answer *any one* Question and carries 10 marks)

20. The runs scored by two players in 10 innings are given:

Player A: 25 65 45 10 50 100 35 80 10 90

Player B: 45 55 50 35 50 65 45 60 40 60

Which player is more consistent?

21 .Calculate a suitable measure of kurtosis for the following data and comment on it.

Class	5 - 15	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65	65 -75
frequency	7	12	25	34	22	12	8

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1B1N19102 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Statistics Degree Examination, November 2019

BAS1C01 – Financial Mathematics

(2019 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. Define force of interest
2. Calculate the accumulated value at time 7 of an annuity of Rs.50 paid in advance starting at time 2
3. What is flat rate of interest
4. Explain a fixed interest security with the help of a cash flow model
5. Differentiate between deferred and immediate annuity
6. Calculate P ,given that I =50 R=1000 i=8% pa effective and n = 10
7. Calculate $a_{10\rceil}$ at i= 8% pa effective.
8. What is repayment mortgage
9. An investor deposits Rs.25000 in a bank account. Calculate the amount accumulated in the investors account after 7.5 years using a simple rate of discount of 8.15% pa.
10. Calculate $\bar{a}_{8\rceil}$ at 7.5% p.a effective
11. What is the formula for δ in terms of i
12. Calculate $s_{10\rceil}^{(12)}$ at an interest rate of 6% p.a. convertible monthly.

(Maximum Marks=20)

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

13. Calculate the flat rate paid on a loan of £48,000 that is repaid over 25 years. Payments are made monthly. Each payment is £278.
14. Derive an expression for the present value of a level immediate annuity payable in advance

15. A loan of £1,000 is to be repaid by level monthly instalments over 10 years using an interest rate of 10% *pa* effective. Calculate the capital repaid in the sixth year.

16. An annuity is payable annually in advance for a term of 20 years. The payment is £500 in year 1, £550 in year 2, and so on, increasing by £50 each year. Calculate the present value of this annuity, assuming that the effective rate of interest is 5% *pa* for the first twelve years and 7% *pa* thereafter.

17. 17.. A continuous payment stream is such that the level rate of payment in year t is $100x1.05^{t-1}$, for $t = 1,2,\ldots,10$. Calculate the present value of this payment stream as at its commencement date, assuming a rate of interest of 10% *pa.*

18. A man makes payments into an investment account of Rs.200 at time 5, Rs.190 at time 6, Rs.180 at time 7, and so on until a payment of Rs.100 at time 15. Assuming an annual effective rate of interest of 3.25%, calculate the present value of the payments at time 4

19. Calculate the present value on 1 June 2019 of payments of Rs.1050 payable on the first day of each month from July 2019 to December 2019 inclusive, assuming a rate of interest of 8% per annum effective

(Maximum Marks=30)

PART-C (Essay)
Answer any 1 Question. Each question carries *ten* marks.

20. a)An annuity-certain is payable monthly in advance for 40 years. The annuity is to be paid at the rate of £100 *pa* for the first 20 years, £120 *pa* for the next 5 years and £200 *pa* for the last 15 years. Determine the present value of the payments as at the commencement of the annuity assuming the annual effective rate of 8% pa effective

(5 Marks)

b)Calculate the present value of a series of 10 annual payments, where the first payment is £500 made in one year's time, and each payment is £100 higher than the previous one. Assume an effective rate of interest of 8% *pa.*

(5 Marks)

21. The force of interest at time t is:

- $\delta(t) = 0.08 \ when \ 0 \leq t < 5$
- $\delta(t) = .13 - 0.01t \ when \ 5 \leq t$

a) Find an expression for the accumulation factor from time 0 to t (5 Marks)

b) Calculate the accumulated value at time 8 of a payment of Rs.400 at time 3.

(5 Marks)

(1 x 10=10 Marks)

14a

1B1N19101 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Mathematics Degree Examination, November 2019

BST1C01 – Introductory Statistics

(2019 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 meant by time series data?
3. What are the properties of a good average?
4. Find the mean of first 'n' natural numbers.
5. What is meant by a skewed curve?
6. Define cumulative frequency distribution.
7. What is the Geometric Mean of numbers 1,0,5,2,10?
8. Distinguish between correlation and regression.
9. What is a scatter diagram?
10. Define seasonal variation
11. What are the components of time series?
12. What is time reversal test for an index number?

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

13. Explain the Central Statistical system in India
14. Draw less than ogive, more than ogive and then obtain median.

Class :	0-10	10-20	20-30	30-40	40-50	50-60	60-70
F :	5	12	28	40	21	10	4

15. Two samples of sizes 40 and 50 respectively have same mean 53 but different standard deviations 19 and 8 respectively. Find the combined S.D. of sample of size 90.

16. Fit a straight line of the form y=ax+b. Also estimate the value of y when x =0

x	:	1	2	3	4	5	6	7
y	:	7	13	19	25	32	40	50

17. Explain the procedure for fitting curve of the form $y = ab^x$.

18. Let x, y be two variables and $u = \frac{x-A}{C}$ and $v = \frac{y-B}{D}$ be two linear transformations of x and y. Then prove that $r_{xy} = r_{uv}$

19. Construct Fisher's index number for the following data.

Commodity	1994		1995	
	Price (p_0)	Quantity (q_0)	Price (p_1)	Quantity (q_1)
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	13

Part C

Answer any one question and carries 10 Marks.

20.

a) Define Coefficient of Variation

b) Calculate Coefficient of variation of the following two series and find which series is more consistent.

Weight in kg	:	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Class A	:	1	2	9	8	5	4	1
Class B	:	3	3	7	10	5	3	1

21. What are index numbers? Briefly discuss the problems in construction of index numbers.