



Register Number:

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ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU-27
B.A. – V SEMESTER
SEMESTER EXAMINATION: NOVEMBER 2020
ECA DE 5618 – ADVANCED STATISTICAL METHODS FOR ECONOMISTS

Time- 2 1/2 hrs

Max Marks-70

This paper contains 2 printed pages and 3 parts

PART A

I. Answer anyTEN of the following. 10X3=30

1. Distinguish between the descriptive and inferential statistics.
2. What are the scales of Measurement?
3. State the meaning of conditional probability.
4. Lucas Tool Rental would like to assign probabilities to the number of car polishers it rents each day. Office records show the following frequencies of daily rentals for the last 40 days. Compute the probability with the relative frequency method

No. of polishers rented	0	1	2	3	4
No. of days	4	6	18	10	2

5. Mention any three characteristics of normal distribution.
6. State the central limit theorem.
7. What are Type I and Type II errors in hypothesis testing?
8. Give the meaning of mutually exclusive and collectively exhaustive events.
9. What is an expected value? Compute the expected value for the following probability distribution of ship arrivals in a harbor.

x	10	11	12	13	14
f(x)	0.4	0.2	0.2	0.1	0.1

10. The manager of a coffee shop needs to hire two employees, one to work at the counter and one to work at the drive-through window. Sara, Megen, Tricia and Jeff all applied for the job. By using permutation formula compute how many ways are there for the manager to place the appointment?
11. What is the rationale for ANOVA?
12. What are Bivariate and multivariate distributions?

PART B

II. Answer any TWO of the following questions. 5x2=10

13. What are the properties of a point estimator?
 14. In an anti-malarial campaign in a certain area, Quinine was administered to 812 persons out of a total population of 3,248. The number of fever cases is shown below

Treatment	Fever	No Fever
Quinine	20	792
No Quinine	220	2216

Check whether the Quinine was effective or not by applying Chi square test.

(Given d.f=1, Critical Chi square for 0.05 is 3.84)

15. The Myrtle Beach international airport's short term parking lot is close to the terminal, so someone meeting an incoming passenger has only a shortcut walk to the baggage claim area, a good place to meet. To decide if the shortcut lot has enough parking places, the manager of airport parking needs to know if the mean time in the lot is more than 40 minutes. A sample of 12 recent customers showed they were in the lot of the following lengths of time, in minutes.

Minutes	55	49	53	47	39	27	64	48	48	53	37	56
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Test whether it is reasonable to conclude that the mean time in the lot is more than 40 minutes by using 't' statistic. (At 0.05 significance level critical 't' value is 1.796)

PART C

II. Answer any TWO of the following 2X15=30

16. Discuss the procedure of hypothesis testing using test of significance approach with an example.
 17. On Thursday morning between 9am to 10 am customers arrive at a mean rate of 1.7 customers per minute at the Oxford University credit union and enter the queue for the teller window. Using Poisson formula with $\mu=1.7$, construct PDF and CDF up to 9 customers arriving.
 18. A manufacturing company has purchased three new machines of different makes and wishes to determine whether one of them is faster than the others in producing a certain output. Five hourly production figures are observed at random from each machine and the results are given below:

Observations	A1	A2	A3
1	25	31	24
2	30	39	30
3	36	38	28
4	38	42	25
5	31	35	28

Use one-way analysis of variance (ANOVA) and determine whether the machines are significantly different in their mean speed (Given at 5% level critical value=3.89)