



ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU-27
B.A. ECONOMICS – V SEMESTER
SEMESTER EXAMINATION: OCTOBER 2019
ECADE 5618: ADVANCED STATISTICAL METHODS FOR ECONOMISTS

Time-2 ½ hrs

Max Marks-70

This paper contains 3 printed pages and 3 parts

I. Answer any TEN of the following questions

3x10=30

1. Differentiate between univariate and bi variate distributions.
2. Mention the approaches of probability.
3. Suppose that five customers (ABCDE) need service calls and maintenance workers can only serve three of them in a morning. In how many ways five customers may be served?
4. Mention any three properties of normal distribution.
5. What are the two types of errors in testing hypothesis? Which one will commonly occur?
6. What is two tailed test of hypothesis?
7. Give the meaning of power of hypothesis test? How is it measured?
8. A random sample of size 16 has 53 mean. The sum of the squares of the deviations taken from mean is 135. Can this sample be regarded as taken from the population having 56 as mean? By applying 't' test, test a hypothesis about the difference between the sample mean and population mean (for 15 d.f, $t_{0.05} = 2.13$)
9. Differentiate between point and interval estimates.
10. What is analysis of variance meant for?
11. State the central limit theorem.
12. What is correlation coefficient?

PART B

II. Answer any TWO of the following questions.

5x2=10

13. What expected value and standard deviation? Calculate expected value and standard deviation of this random variable x by using the PDF shown and describe the shape of the distribution.

X	60	70	80	90
P(x)	0.4	0.3	0.2	0.1

14. Thousand Students at college level are graded according to their I.Q and their economic condition. Use chi square test to the null hypothesis that there is no association between economic condition and level of I Q.(for $\nu=2$, chi square $_{0.05}=5.99$)

Economic condition	I Q		
	High	Medium	Low
Rich	160	300	140
Poor	140	100	160

15. Following is the promotion list of Bangalore city police officers

Promotion status	Men(M)	Women (W)	Total
Promoted (A)	288	36	324
Not promoted (A^c)	672	204	876
Total	960	240	1200

M=Officer is a man

W=officer is a women

A= officer is promoted

A^c =officer is not promoted

Based on the information given,

(a) find out the joint and marginal probabilities

(b) What is the probability of an officer is man and not promoted

- (c) What is the probability of an officer is women and promoted
- (d) What is the probability of an officer is women and not promoted
- (e) What is the probability of an officer is promoted given that an officer is man.

PART C

III. Answer any TWO of the following questions. 15x2=30

16. On average, 20 percent of the emergency room patients at hospital in Bengaluru lack health insurance. In a random sample of four patients , What is the probability that two will be uninsured? Define X =number of uninsured patients and set $\pi=0.80$. By using the binomial probability construct the PDF and CDF. Represent the same in a graph.

17. To assess the significance of possible variation in performance in a certain test between the convent schools of a city, a common test was given to a number of students taken at random from the fifth class of each of the four schools concerned. Is the variation in the performance of school children attributable to chance or do these sample indicate actual differences in the means? Construct an one way ANOVA.

(The table value of F for $\nu_1=3$ and $\nu_2=16$ at 5% level of significance is 3.24)

A	B	C	D
8	12	18	13
10	11	12	9
12	9	16	12
8	14	6	16
7	4	8	15

18. Discuss the procedure of hypothesis testing with an example.