



LOYOLA-INTERNATIONAL ACADEMIC COLLABORATION

LOYOLA COLLEGE CHENNAI – 600 034

BBA-FRANCE – END SEMESTER EXAMINATION

FOURTH SEMESTER – APRIL 2023

BBA 436 – ECONOMETRICS

Date : 09-05-2023

Dept. No.

Max. : 100 Marks

Time : 01:00 PM - 04:00 PM

PART A

ANSWER ANY FIVE

(5x6 = 30 MARKS)

EXPLAIN WITH RELEVANT DIAGRAMS AND EXAMPLES

1. Definition and scope of econometrics
2. Standard deviation and its uses
3. Coefficient of Determination
4. Central Limit Theorem
5. Type 1 and Type 2 error
6. One Tail and Two Tail Test
7. Confidence Interval

PART B

ANSWER ANY SEVEN

(7 X 10 = 70 MARKS)

8. A research study was conducted to examine the clinical efficacy of a new antidepressant. Depressed patients were randomly assigned to one of three groups: a placebo group, a group that received a low dose of the drug, and a group that received a moderate dose of the drug. After four weeks of treatment, the patients completed the Beck Depression Inventory. The higher the score, the more depressed the patient. The data are presented below. Compute the appropriate test.

<u>Placebo</u>	<u>Low</u>	<u>Moderate</u>
-	<u>Dose</u>	<u>Dose</u>
38	22	14
47	19	26
39	8	11
25	23	18
42	31	5

1. What is your computed answer?
2. What would be the null hypothesis in this study?
3. What would be the alternate hypothesis?
4. What is your F?
5. Is there a significant difference between the groups?
6. Interpret your answer

9. Campus Stores has been selling the Believe It or Not: Wonders of Statistics Study Guide for 12 semesters and would like to estimate the relationship between sales and number of sections of elementary statistics taught in each semester. The following data have been collected.

Sales	33	38	24	61	52	45	65	82	29	63	50	79
No of sections	3	7	6	6	10	12	12	13	12	13	14	15

- Develop the estimating equation that best fits the data
- Calculate the sample coefficient of determination and the sample coefficient of correlation

10. A landlord is interested in seeing whether his apartment rents are typical. Thus, he has taken a random sample of 11 rents and apartment sizes of similar apartment complexes. The data follow

Rent	230	190	450	310	218	185	340	245	125	350	280
No of bedrooms	2	1	3	2	2	2	2	1	1	2	2

- Develop the estimating equation that best fits the data
- Calculate the sample coefficient of determination and the sample coefficient of correlation
- Predict the rent for a 2 bed room apartment

11. Susan Sound predicts that students will learn most effectively with a constant background sound, as opposed to an unpredictable sound or no sound at all. She randomly divides twenty-four students into three groups of eight. All students study a passage of text for 30 minutes. Those in group 1 study with background sound at a constant volume in the background. Those in group 2 study with noise that changes volume periodically. Those in group 3 study with no sound at all. After studying, all students take a 10-point multiple choice test over the material. Their scores follow:

Group		Scores							Test
Constant Sound	7	4	6	8	6	6	2	9	
Random Sound	5	5	3	4	4	7	2	2	
No Sound	2	4	7	1	2	1	5	5	

Do you support her hypothesis?



12. Do Dogs Resemble Their Owners? Researchers wanted to see if it is really true that dogs resemble their owners. Here is a two-way table summarizing their results:

	Resembles Owner	Doesn't Resemble Owner
Purebred Dogs	16	9
Mixed – Breed Dogs	7	13

Do these data provide convincing evidence of an association between dog breed and resemblance to owner at the 0.05 significance level?

13. The three samples below have been obtained from normal populations with equal variances. Test the hypothesis at 5% level that the population means are equal.

8	7	12
10	5	9
7	10	13
14	9	12
11	9	14

14 . The IQ s of army volunteers in a given year are normally distributed with mean 110 and standard deviation 10. The army wants to give advance training to 20% of those recruits with the highest scores . What is the lowest IQ score acceptable for the advanced training.

15 . Two thousand electric bulbs with an average life of 1000 hours and a standard deviation of 200 hours are installed in a town. Assuming the lives of the bulbs to be normally distributed, answer the following

1. What number of bulbs might be expected to fall in the first 700 burning hours.
2. What is the minimum burning life of top one quarter of bulbs?

16. In a sample survey of public opinion , answer to the questions

1. Do you drink ?
2. Are you in favour of local option on sale of liquor?

	Yes	No
Yes	56	31
No	18	6

Can u infer whether or not the local option on the sale of liquor is dependent on individual drink?

17. The record for last several years of applicants for admission into engineering colleges for a test showed that their mean score was 115. An administrator is interested in knowing whether the caliber of the recent applicants has changed. For the purpose of testing this hypothesis the scores of the last 100 students is obtained from the admission office. The mean for this turned out to be 118, and standard deviation 30, which may also be assumed for the population as a whole. Use 5% level of significance.

18. The Stork Foundation wishes to show with statistics that, contrary to the popular belief, storkes do bring babies. Thus it has collected data on the number of storks and the number of babies(both in thousands) in several large cities in central Europe.

Storks	27	38	13	24	6	19	15
Babies	35	46	19	32	15	31	20

1. Compute the sample coefficient of determination and sample correlation coefficient for these data.
2. Has statistical science disproved popular belief?

19. A business owner had been working to improve employee relations in his company. He predicted that he met his goal of increasing employee satisfaction from 65% to 80%. Employees from four departments were asked if they were satisfied with the working conditions of the company. The results are shown in the following table:

	Finance	Sales	Human Resources	Technology
Satisfied	12	38	5	8

Dissatisfied	7	19	3	1
Total	19	57	8	9

We can use chi square to determine whether the results support or reject the business owner's prediction.

20. A dice is tossed 120 times with the full results

No turned up	1	2	3	4	5	6
freq	30	25	18	10	22	15

Test the hypothesis that the dice is unbiased.
