

C 22863

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Name.....

Reg. No.....

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2022

(CCSS)

Economics

ECO 2C 07—STATISTICS FOR ECONOMICS

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A*Answer all questions.**Each question carries 1 mark.*

1. Let A and B be two events such that the occurrence of A implies occurrence of B, but not vice-versa, then the correct relation between $P(a)$ and $P(b)$ is ?
 - (a) $P(A) < P(B)$.
 - (b) $P(B) \geq P(A)$.
 - (c) $P(A) = P(B)$.
 - (d) $P(A) \geq P(B)$.
2. To test the randomness of a sample, the appropriate test is :
 - (a) Run Test.
 - (b) Sign Test.
 - (c) Median Test.
 - (d) Page's Test.
3. Analysis of variance is a statistical method of comparing the _____ of several populations.
 - (a) Standard deviations.
 - (b) Variances.
 - (c) Means.
 - (d) Proportions.
4. When the null hypothesis is accepted, it is possible that :
 - (a) A correct decision has been made.
 - (b) A Type-II Error has been made.
 - (c) Both (A) and (B) have occurred.
 - (d) Neither (A) nor (B) has occurred.

Turn over

5. Which of the following statements is correct ?
- (a) A point estimate is an estimate of the range of a population parameter.
 - (b) A point estimate is an unbiased estimator if its standard deviation is the same as the actual value of the population standard deviation.
 - (c) A point estimate is a single value estimate of the value of a population parameter.
 - (d) All of the above statements are correct.
6. The rejection probability of Null Hypothesis when it is true is called as ?
- (a) Level of Confidence.
 - (b) Level of Significance.
 - (c) Level of Margin.
 - (d) Level of Rejection.
7. What is the area under a conditional Cumulative density function ?
- (a) 0.
 - (b) Infinity.
 - (c) 1.
 - (d) Changes with CDF.
8. A t -test is a significance test that assesses :
- (a) The means of two independent groups.
 - (b) The medians of two dependent groups.
 - (c) The modes of two independent variables.
 - (d) The standard deviation of three independent variables.
9. Which of the following statements best describes the exponential probability distribution ?
- (a) The exponential probability distribution is skewed to the right.
 - (b) The exponential probability distribution is skewed to the left.
 - (c) The exponential probability distribution is mound shaped.
 - (d) None of the above.
10. What would be the probability of an event 'G' if H denotes its complement, according to the axioms of probability ?
- (a) $P(G) = 1/P(H)$.
 - (b) $P(G) = 1 - P(H)$.
 - (c) $P(G) = 1 + P(H)$.
 - (d) $P(G) = P(H)$.

(10 × 1 = 10 marks)

Part B (Very Short Answer Questions)

*Answer any **five** questions.*

Each question carries 2 marks.

*Answer in one **or** two sentences each.*

11. What do you mean by mutually exclusive events ?
12. What is meant by a point estimate of a population parameter ?
13. Define Type I error.
14. Bring out the difference between proper subset and improper subset.
15. Write a note on stratified sampling.
16. What is main effect in ANOVA ?
17. Define joint probability function
18. A pair of dice is tossed 180 times. What is the probability that the sum on the faces is equal to 7 on 20 % or more of the tosses ?

(5 × 2 = 10 marks)

Part C (Short Answer Questions)

*Answer any **eight** questions.*

Each question carries 5 marks.

19. Discuss the assumptions of ANOVA.
20. State the difference between simple and composite hypothesis.
21. Calculate correlation co-efficient using the following data :

X	Y
43	99
21	65
25	79
42	75
57	87
59	81

22. Discuss briefly the importance of least square method.

Turn over

23. Write a short note on Man Whitney U test.
24. Suppose 70 % of the population support the ban on assault weapons. What is the probability that between 65 % and 75 % in a poll of 100 individuals will support the ban on assault weapons ?
25. Write a short note on Classical approach of probability.
26. Briefly explain the Bayes' theorem.
27. Give an account of the importance of the Central limit theorem.
28. Suppose 5 % of all adults in a country have 10 or more credit cards. Find the standard error of the sample proportion in a sample of 1000 adults who have 10 or more credit cards.
29. Explain the properties of a normal curve.
30. Write a short note on continuous random variable.

(8 × 5 = 40 marks)

Part D (Essay Type Questions)*Answer any two questions.**Each question carries 10 marks.*

31. A producer of steel cables wants to test if the steel cables it produces have a breaking strength of 5000 lb. The producer takes a random sample of 64 pieces and finds that the average breaking strength is 5100 lb and the sample standard deviation is 480 lb. Should the producer accept the hypothesis that its steel cable has a breaking strength of 5000 lb at the 5 % level of significance ?
32. Explain in detail the properties of a good estimator.
33. A random sample of 395 people were surveyed and each person was asked to report the highest education level they obtained. The data that resulted from the survey are summarized in the following table :

	High School	Bachelors	Masters	Ph.d.	Total
Female	60	54	46	41	201
Male	40	44	53	57	194
Total	100	98	99	98	395

Are gender and education level dependent at 5 % level of significance ?

34. A clinical trial is run to compare weight loss programmes and participants are randomly assigned to one of the comparison programs and are counselled on the details of the assigned program. Participants follow the assigned program for 8 weeks. The outcome of interest is weight loss, defined as the difference in weight measured at the start of the study (baseline) and weight measured at the end of the study (8 weeks), measured in kilograms :

Low Calorie	Low Fat	Low Carbohydrate	Control
8	2	3	2
9	4	5	2
6	3	4	- 1
7	5	2	0
3	1	3	3

Is there a statistically significant difference in the mean weight loss among the four diets ?

(2 × 10 = 20 marks)