D 140520 **(Pages : 4)** **Name.....**

Reg. No.....

SECOND SEMESTER M.A. (CBCSS) REGULAR/SUPPLEMENTARY DEGREE EXAMINATION, APRIL 2026

Economics

ECO 2C 08—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—II

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Part A (Multiple Choice Questions)

Answer **all** *questions.*
Each question carries 1/5 *weightage.*

1. The Cartesian product of two sets A and B results in a set containing :
   (a) Ordered pairs of elements, where the first element is from set A and the second element is from set B.
   (b) Elements that are common to both sets A and B.
   (c) Elements that are present in either sets A or set B.
   (d) Elements that are prsent in both sets A and B, along with their corresponding indices.
2. Type II error is also known as :
   (a) False positive. (b) False negative.
   (c) True positive. (d) True negative.
3. The number of phone calls received by a call center follows a Poisson distribution with an average rate of 20 calls per hour. What is the probability of receiving at least 25 calls in a given hour ?
   (a) 0.037. (b) 0.124.
   (c) 0.221. (d) 0.295.
4. The Wilcoxon signed-rank test is used to compare :
   (a) Two independent samples.
   (b) Two related samples.
   (c) Three or more independent samples.
   (d) Three or more related samples.

Turn over

5. Maximum likelihood estimation involves :

   (a) Maximizing the likelihood function to find the parameter estimates.

   (b) Minimizing the likelihood function to find the parameter estimates.

   (c) Maximizing the sum of squared residuals to find the parameter estimates.

   (d) Minimizing the sum of squared residuals to find the parameter estimates.

6. A factory produces light bulbs, and the probability of a defective bulb is 0.05. If a sample of 20 bulbs is randomly selected, what is the probability that exactly 3 bulbs are defective ?

   (a) 0.270. (b) 0.285.

   (c) 0.304. (d) 0.327.

7. If the *p*-value in ANOVA is less than the chosen significance level (e.g., $\alpha = 0.05$), we :

   (a) Reject the null hypothesis and conclude that there are significant differences between at least two group means.

   (b) Fail to reject the null hypothesis and conclude that there are significant differences between the group means.

   (c) Fail to reject the null hypothesis but cannot make a conclusion about the group means.

   (d) Reject the null hypothesis and conclude that the means of all grouops are significantly different from each other.

8. The mean of a probability distribution is also known as :

   (a) Variance. (b) Standard deviation.

   (c) Median. (d) Expected value.

9. The law of large numbers applies to which type of random variables ?

   (a) Continuous random variables.

   (b) Discrete random variables.

   (c) Both continuous and discrete random variables.

   (d) Neither continuous nor discrete random variables.

10. The bias of an estimator refers to :

    (a) The accuracy of the estimator.

    (b) The variability of the estimator.

    (c) The systematic error in the estimator.

    (d) The efficiency of the estimator.

11. In how many ways can a committee of 3 people be formed from a group of 7 people ?

    (a) 7. (b) 21.

    (c) 35. (d) 42.

12. The Chi-square distribution is :

    (a) Symmetric. (b) Skewed to the right.

    (c) Skewed to the left. (d) Bimodal.

13. A study measures the blood pressure of a sample of 200 individuals and finds a mean blood pressure of 120 mmHg, with a standard deviation of 10 mmHg. What is the 90 % confidence interval for the population mean blood pressure ?

    (a) (118 mmHg, 122 mmHg). (b) (119 mmHg, 121 mmHg).

    (c) (119.5 mmHg, 120.5 mmHg). (d) (119.8 mmHg, 120.2 mmHg).

14. Which of the following is a property of the *z*-test with a large sample size ?

    (a) It assumes a normal population distribution.

    (b) It is more robust to violations of assumptions.

    (c) It requires the population standard deviation to be known.

    (d) It is appropriate for small sample sizes.

15. Let X and Y be two independent random variables with expectations E[X] = 6 and E[Y] = 9. What is the expectation of their difference, E[X – Y] ?

    (a) – 15. (b) – 3.

    (c) 3. (d) 15.

(15 × 1/5 = 3 weightage)

Part B (Very Short Answer Questions)

Answer any **five** *questions.*
Each question carries a weightage of 1.

16. What are Mathematical expecations ?
17. What is the lognormal distribution ?
18. Define Statistical inference.
19. What is the level of significance ?
20. What is two-way of ANOVA ?
21. What is an identical set ?
22. What is a continuous probability distribution ?
23. What is the F distribution ?

(5 × 1 = 5 weightage)

Turn over

Part C (Short Answer Questions)

Answer any **seven** *questions.*
Each question carries a weightage of 2.

24. Distinguish between a Simple and a composite hypothesis.
25. Discuss the importance of standard error.
26. Explain the characteristics of a log normal distribution.
27. Discuss the significance of Mathematical expectations in probability theory.
28. Discuss the concept of law of large numbers.
29. Explain the properties of T distribution.
30. The number of hours studied and the corresponding test scores of a group of students are given below. Calculate the correlation coefficient :

    Number of hours studied : [5, 8, 4, 7, 6]

    Test scores : [75, 92, 68, 80, 82].
31. State the assumptions of ANOVA.
32. Discuss the salient features of the Chi square test of goodness of fit.
33. Describe the concept of Permutations and combinations using appropriate examples.

(7 × 2 = 14 weightage)

Part D (Essay Type Questions)

Answer any **two** *questions.*
Each question carries a weightage of 4.

34. Explain in detail the Central Limit Theorem.
35. Discuss in detail the method of maximum likelihood.
36. Explain the Wald Wolfowitz test.
37. A study was conducted to compare the effects of three different study techniques on exam scores. Three groups of students were randomly assigned to each study technique, and their exam scores were recorded. The following data were obtained :

    Group 1 : 85, 90, 92, 88, 87

    Group 2 : 75, 78, 82, 80, 79

    Group 3 : 92, 95, 90, 88, 91

    At a 5 % level of significance, test whether there is a significant difference in the average exam scores among the three study techniques.

(2 × 4 = 8 weightage)

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Economics

ECO 2C 08—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—II

(2019 Admission onwards)

(Multiple Choice Questions for SDE Candidates)

Time : 20 Minutes	**Total No. of Questions : 20**	**Maximum : 5 Weightage**

INSTRUCTIONS TO THE CANDIDATE

1. This Question Paper carries Multiple Choice Questions from 1 to 20.
2. The candidate should check that the question paper supplied to him/her contains all the 20 questions in serial order.
3. Each question is provided with choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and enter it in the main answer-book.
4. The MCQ question paper will be supplied after the completion of the descriptive examination.

ECO 2C 08—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—II

(Multiple Choice Questions for SDE Candidates)

1. A numerical value used as a summary measure for a sample, such as a sample mean, is known as a :

   (A) Population Parameter. (B) Sample Parameter.

   (C) Sample Statistic. (D) Population mean.

2. Statistics branches include :

   (A) Applied Statistics. (B) Mathematical Statistics.

   (C) Industry Statistics. (D) Both (A) and (B).

3. Individual respondents, focus grouops and panels of respondents are categorised as :

   (A) Primary Data Sources. (B) Secondary Data Sources.

   (C) Itemised Data Sources. (D) Pointed Data Sources.

4. Specialized processes such as graphical and numerical methods are utilised in :

   (A) Education Statistics. (B) Descriptive Statistics.

   (C) Business Statistics. (D) Social Statistics.

5. In a binomial distribution, $n = 5$, mean equals 2,what is the value of q ?

   (A) 0.4. (B) 0.5.

   (C) 0.6. (D) 0.7.

6. Three fair coins tossed simultaneously what is the probability to get exact 2 head ?

   (A) 3/8. (B) 2/8.

   (C) 1/8. (D) 1.

7. A statement about a population developed for testing is called :

   (A) Hypothesis. (B) Hypothesis testing.

   (C) Level of significance. (D) Test-statistic.

8. Any statement whose validity is tested based on a sample is called :

   (A) Null hypothesis. (B) Alternative hypothesis.

   (C) Statistical hypothesis. (D) Simple hypothesis.

9. The alternative hypothesis is also called :

   (A) Null hypothesis. (B) Statistical hypothesis.

   (C) Research hypothesis. (D) Simple hypothesis.

10. If a hypothesis specifies the population distribution is called :

(A) Simple hypothesis. (B) Composite hypothesis.

(C) Alternative hypothesis. (D) None of the above.

11. If the critical region is located equally in both sides of the sampling distribution of test statistic, the test is called :

(A) One tailed. (B) Two tailed.

(C) Right tailed. (D) Left tailed.

12. Test of hypothesis $H_0 : \mu = 50$ against $H_1 : \mu < 50$ leads to :

(A) Left-tailed test. (B) Right-tailed test.

(C) Two-tailed test. (D) Difficult to tell.

13. The range of test statistic z is :

(A) 0 to 1. (B) -1 to $+1$.

(C) 0 to ∞. (D) $-\infty$ to $+\infty$.

14. The probability associated with committing type I error is :

(A) β. (B) α.

(C) $1 - \beta$. (D) $1 - \alpha$.

15. $1 - \alpha$ is also called :

(A) Confidence coefficient. (B) Power of the test.

(C) Size of the test. (D) Level of significance.

16. Size of critical region is known as :

(A) β. (B) $1 - \beta$.

(C) Critical value. (D) Size of the test.

17. Level of significance α lies between :

(A) -1 and $+1$. (B) 0 and 1.

(C) 0 and n. (D) $-\infty$ to $+\infty$.

18. The probability of rejecting H_0 when it is false is called :

(A) Power of the test. (B) Size of the test.

(C) Level of confidence. (D) Confidence coefficient.

19. Power of a test is related to :

(A) Type I error. (B) Type II error.

(C) Both (A) and (B). (D) Neither (A) and (B).

20. In testing hypothesis $\alpha + \beta$ is always equal to :

(A) One. (B) Zero.

(C) Two. (D) Difficult to tell answer.