REV-01
MEC/15/20

2025/05

SET A

MA ECONOMICS
SECOND SEMESTER
STATISTICS
MEC – 203
[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 1.30 hrs. **Full Marks: 35**

Objective

Time: 15 mins. **Marks: 10**

Choose the correct answer from the following: ***1×10=10***

1. Two events are mutually exclusive if:
   a. They cannot happen at the same time
   b. They always happen together
   c. They have the same probability
   d. They are dependent on each other

2. If two events A and B are dependent, the conditional probability of B given A, i.e, P(B | A) is calculated as.....
   a. P(A∩B)/ P(A)
   b. P(A∩B)/ P(B)
   c. P(B)/P(A)
   d. P(A). P(B)

3. If there is a linear trend present in the population, then which of the following methods is the most appropriate sampling technique?
   a. Cluster Sampling
   b. Systematic Sampling
   c. Stratified Sampling
   d. Simple Random Sampling

4. If the correlation coefficient r=1, what does it indicate about the relationship between the two variables?
   a. There is no correlation
   b. The variables are perfectly negatively correlated
   c. The variables are perfectly positively correlated
   d. The variables are weakly correlated

5. Which of the following is a type of probability sampling?
   a. Convenience sampling
   b. Snowball Sampling
   c. Stratified Sampling
   d. Judgmental Sampling

6. Which of the following is an example of a discrete random variable?
   a. The height of a person
   b. The number of children in the family
   c. The time it takes to run a race
   d. The weight of a watermelon

7. A scatter plot shows a set of points forming a straight line with some variation. What does this indicate?
   a. A perfect linear relationship
   b. A strong linear relationship with some error
   c. A perfect non-linear relationship
   d. No relationship between the variables.

8. In hypothesis testing, the null hypothesis (H_0) generally states that:
   a. There is a significant effect
   b. The alternative is always true
   c. There is no effect or no difference
   d. Data should not be collected

9. What is a Type I error in hypothesis testing?
   a. Accepting a true null hypothesis
   b. Rejecting a true null hypothesis
   c. Accepting a false null hypothesis
   d. Rejecting a false null hypothesis

10. Which test is commonly used to compare the means of two groups?
   a. Chi-square test
   b. F-test
   c. t-test
   d. Z-test

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Descriptive

Time : 1 Hr. 15 Mins. **Marks : 25**

[Answer question no.1 & any two (2) from the rest]

1. What is the probability of drawing either a heart or a diamond from a standard deck of 52 cards? 5

2. A factory has three machines A, B and C. Machine A produces 50 % of the total output, B produces 30 %, and C produces 20 %. The defect rates are : 10
   Machine A : 3 % defective
   Machine B : 4 % defective
   Machine C : 5 % defective
   A product is chosen at random and is found to be defective. What is the probability that it was produced by Machine B?

3. The data set below represents the height (in cm) and weight (in kg) of five individuals: 7+3=10

Height (x)	Weight (y)
100	30
110	35
120	40
130	45
140	50

   Find the line of best fit (linear regression equation) to predict weight (y) based on height (x).
   Using your equation, predict the weight of an individual whose height is 125 cm.

4. Define Karl Pearson's correlation coefficient and state its main limitations. 5+5=10
   If the following measures are given, find the number of pairs of values (n)
   The correlation coefficient r =0.5,
   The sum of products of differences from the means $\sum dx\, dy = 120$,
   The sum of squared differences for x values $\sum d^2x = 90$ and
   The standard deviation for y value $s\sigma_y = 8$

5. Explain the concept of hypothesis testing in statistics. How do Type I and Type II errors differ? Illustrate your answer with suitable examples. 5+5=10

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