SECOND SEMESTER M.A. DEGREE EXAMINATION, MAY-2017

(Regular/Supplementary/Improvement)

(CUCSS - PG)

CC 15P ECO2 C08 – QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS – II

(Economics)

(2015 Admission Onwards)

Time: Three Hours Maximum: 36 Weightage

Part A

(Answer *all* questions. Each bunch of ***four*** questions carries a weightage 1)

1. If X is a random variable with variance 2, then V(2X) is:

   a. 2 b. 8 c. 4 d. 1

2. If F(x) is the distribution function of a random variable X, then F(+ ∞) equals :

   a. 0 b. ∞ c. 1 d. - ∞

3. Pick up the correct statement from those given below.

   a. Normal distribution is symmetric and mesokurtic

   b. Normal distribution is symmetric and platykurtic

   c. Normal distribution is positively skewed and platykurtic

   d. Normal distribution is negatively skewed and leptokurtic

4. A normal population has mean 75 and standard deviation 8. A random sample of size 100 is selected. The expected value of the sample mean $\bar{X}$ is:

   a. 7.5 b. 75 c. 64 d. 100

5. An unbiased estimator for population mean μ is :

   a. sample mean b. sample variance c. population variance d. none of these

6. Variance of a Chi-square distribution with 10 degrees of freedom is :

   a. 10 b. 20 c. 40 d. 5

7. Confidence interval for the proportion of a population involves :

   a. Normal distribution b. F Distribution

   c. Chi-Square distribution d. Student's t distribution

8. For a normal distribution with mean μ and variance σ^2, standard error of the sample mean $\bar{X}$ is:

   a. $\frac{\sigma}{n}$ b. $\sigma + \mu$ c. $\mu^2 + \sigma^2$ d. $\frac{\sigma}{\sqrt{n}}$

9. In large sample test for testing the equality of population proportions, the test statistic follows:

a. Normal distribution
b. t distribution
c. Chi-square distribution
d. F distribution

10. Probability of rejecting a null hypothesis Ho when it is actually false is known as :

a. Power of the test
b. significance level
c. Type I error
d. Type II error

11. Student's t distribution is :

a. Positively skewed
b. Symmetric
c. Negatively skewed
d. None of these

12. In Analysis of Variance, we test :

a. Equality of several variances
b. Equality of several means
c. Significance of variance
d. Significance of mean

Part B (Very Short Answer Questions)

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

13. A random variable X has the following probability function

X :	-2	-1	0	1	2	3
f(x) :	0.1	k	0.2	2k	0.3	k

Determine the value of k.

14. Write down the probability mass function of a poisson distribution with mean unity.
15. State the probability mass function of a binominal distribution having mean 6 and variance 3.
16. Define log-normal distribution.
17. Define unbiasedness of an estimator.
18. Define student's 't' statistic.
19. Distinguish between point estimation and interval estimation.
20. Distinguish between type I and Type II errors.

Part C. (Short Answer Questions)

(Answer any ***eight*** questions. Each question carries a weightage 2)

21. Define distribution function of a random variable and state its properties.
22. Obtain mean of a binomial distribution.
23. What are the conditions under which a binominal distribution tends to the poisson distribution. Point out some real life situations where we can use poisson distribution effectively.
24. In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the mean and standard deviation of the distribution.

25. Define Chi-square distribution and state its important properties.
26. Explain
    a. Unbiasedness
    b. Consistency
27. A sample of size 16 has 54 as mean. The sum of squared deviations from the mean is 135. Can the sample be regarded as taken from a population having 56 as mean? Also construct the confidence limits in which the mean is expected to lie.
28. Explain t test for dependent samples.
29. Explain the terms simple hypothesis and composite hypothesis
30. Explain the concepts - Significance level and Power of test.
31. Derive $100(1-\alpha)\%$ confidence interval for population mean μ.

Part D (Essay Questions)

(Answer any ***three*** questions. Each question carries a weightage 4)

32. Discuss the features of normal distribution. Why is this distribution assigned an important role in statistical theory.
33. Discuss the desirable properties of a good estimator. Show that sample mean is an unbiased estimator for the population mean whereas sample variance is a biased estimator for the population variance, on the basis of a random sample of size 'n' form N (μ, σ^2).
34. Before an increase in excise duty on tea 450 people out of a sample of 600 persons were found to be tea drinkers. After an increase in excise duty 400 persons were found to be tea drinkers in a sample of 600 people. Examine whether there is any significant decrease in the consumption of tea because of the increase in excise duty.
35. a. Explain clearly the technique of Analysis of Variance for data with one way classification
    b. The following table gives the scores of 15 students in three schools. Carry out the analysis of variance and state your conclusion.

School I	9,	7,	6,	5,	8
School II	7,	4,	5,	4,	5
School III	6,	5,	6,	7,	6

36. Write short notes on any three of the following
    a. Log-normal distribution and its applications
    b. F distribution and its uses
    c. Mathematical expectation and its properties
    d. Standard error and its uses

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