

36. Explain one way ANOVA. From the following data test whether the three items are homogeneous.

Item I	25	22	26	24	25	28	21	29		
Item II	24	23	27	25	28	23	25	26	29	30
Item III	20	24	21	27	26	20	22	18	20	

(3 x 4 = 12 Weightage)

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(Pages: 4)

Name.....

Reg. No.....

SECOND SEMESTER M.A. DEGREE EXAMINATION, MAY 2018

(Regular/Supplementary/Improvement)

(CUCSS – PG)

(Economics)

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

(2015 Admission onwards)

Time: Three Hours

Maximum: 36 Weightage

Part A

Answer *all* questions. Each questions carries ¼ weightage.

- If X is a random variable having the probability density function f(x), then E(X) is called:
 - Median
 - Arithmetic mean
 - Geometric mean
 - Mean deviation about the mean
- A distribution for which mean equal to variance is :
 - Binomial distribution
 - Geometric distribution
 - Normal distribution
 - Poisson distribution
- For a normal curve the Q.D, M.D, and S.D are in the ratio :
 - 10:12:15
 - 15:12:10
 - 10:15:12
 - 12:10:15
- The standard error of the sample mean is :
 - $\frac{\sigma^2}{2n}$
 - $\frac{\sigma}{n}$
 - $\frac{\sigma}{\sqrt{n}}$
 - $\frac{\sigma^2}{n}$
- The mean and variance of a binomial random variable are 6 and 3 respectively. Then the distribution is :
 - B(12,1/2)
 - B (19, 1/3)
 - B (6, 1/3)
 - B (12, 1/3)
- The probability distribution followed by a statistics is known as :
 - Uniform distribution
 - Sampling distribution
 - Cumulative distribution
 - Standard distribution
- An unbiased estimator of mean of a population, μ is :
 - Sample mean
 - Sample variance
 - Sample proportion
 - None of these
- The probability of rejecting a H_0 when it is actually true is known as :
 - Significance level
 - Type I error
 - Power of the test
 - Type II error
- The shape of the frequency curve of Student's 't' distribution is :
 - Straight line
 - Positively skewed
 - Negatively skewed
 - Symmetric

(1)

Turn Over

10. The distribution used to test independence of two characteristics is:
 a) Normal distribution b) Chi square distribution
 c) Student's 't' distribution d) 'F' distribution
11. Any function of the sample values is called :
 a) Parameter b) Hypothesis
 c) Statistic d) Degrees of freedom
12. When the observed and expected frequencies perfectly coincide the value of Chi-square statistic will be :
 a) ± 1 b) 0 c) Greater than one d) Less than one
- (12 x ¼ = 3 Weightage)**

Part B

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

13. Define distribution function of a random variable.
14. A random variable X assumes values -1, 0 and 1 with equal probabilities. Find the expected valued of the random variable X.
15. For a Poisson distribution with parameter 2 state the probability mass function. What is the mean of this distribution.
16. State any two properties of mathematical expectation.
17. Distinguish between Type I and Type II errors.
18. Define level of significance and power of a test.
19. Define standard error of a statistic.
20. What are the applications of Chi-square distribution?

(5 x 1 = 5 Weightage)

Part C

Answer any *eight* questions. Each question carries 2 weightage.

21. A discrete random variable x has the following probability distribution.
- | | | | | | |
|----------|---|---|----|----|----|
| X | : | 1 | 2 | 3 | 4 |
| P[X = x] | : | k | 2k | 3k | 4k |
- Evaluate the constant k and determine $P(X \leq \frac{5}{2})$
22. State any four properties of the distribution function of a random variable.
23. Define binomial distribution. State the conditions under which a binomial distribution tends to the Poisson distribution.
24. Write any two properties of student's t distribution. State its important uses.

(2)

25. Define sampling distribution. Write down the distribution of the sample mean in sampling from a normal population.
26. Explain paired 't' test.
27. A sample of 100 measurements on breaking strength of cotton threads gave a mean of 7.4 and standard deviation 1.2 grams. Find 95% confidence limits for the mean breaking strength.
28. Suppose that the average life of a gas cylinder is 40 days with a standard deviation of 8 days. Assuming the life of a gas cylinder to follow the normal distribution, if 1,00,000 cylinders are issued how many will need replacement after 45 days and how many will need replacement before 40 days.
29. Define statistical hypothesis and distinguish between null and alternative hypothesis.
30. Show that for a Poisson distribution mean is equal to its variance.
31. Explain any form of Central Limit Theorem.

(8 x 2 = 16 Weightage)

Part D

Answer any *three* questions. Each question carries 4 weightage.

32. Describe normal distribution and explain its distinctive features.
33. a) Distinguish between an estimator and an estimate. Explain Fisher's properties of a good estimator
 b) Explain the test for equality of proportions
34. Samples of two types of electric light bulbs were tested for length of life and following data were obtained.
- | | Type I | Type II |
|--------------|---------------|----------------|
| Sample size | 8 | 7 |
| Sample means | 1234 hours | 1086 hours |
| Sample S.D. | 36 hrs | 40 hrs |
- Is the difference between the means of samples significant. ($\alpha = 0.05$)
35. (a) Explain the t test used for the mean of a normal population when the sample size is small and population standard deviation is unknown
 (b) Certain pesticide is packed into bags by a machine. A random sample of 10 bags is drawn and the contents are found to weigh as follows. 50, 49, 52, 44, 45, 48, 46, 45, 49, 42. Test if the average weight of packing can be taken to be less than 50. ($\alpha = 0.05$)

(3)

Turn Over