

SECOND SEMESTER M.A. DEGREE EXAMINATION, JUNE 2018
(CUCSS-PG)

Economics

ECO 2C 08—QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS—II
(2015 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A (Multiple Choice)

Answer all questions.

Each question carries a weight of $\frac{1}{4}$.

1. For a Poisson distribution mean is 9 and standard deviation is 3 then skewness is :
(a) $\frac{1}{3}$. ✓ (b) $\frac{1}{6}$.
(c) $\frac{1}{9}$. (d) 3.
2. A distribution for which mean greater than variance :
(a) Geometric. (b) Binomial. ✓
(c) Poisson. (d) Exponential.
3. If X and Y are independent normal variates with mean 1 and -1 and standard deviations 1 and 2 respectively. Then $Z = 2X - 3Y$ is normal with :
(a) Mean - 5 and standard deviation 40.
(b) Mean 5 and variance 40.
(c) Mean 5 and standard deviation 40. ✓
(d) Mean - 5 and variance 40.
4. If X follow standard normal then $2X + 3$ follows :
(a) F-distribution. (b) Chi-square distribution.
(c) Normal distribution. ✓ (d) t-distribution.
5. If X and Y are independent standard normal variates. Then the distribution of X^2/Y^2 is :
(a) Normal with mean 2 and standard deviation 1.
(b) Chi-square.
(c) t. ✗
(d) F. ✓

Turn over

6. Standard error of sample mean is :

(a) $\frac{\sigma}{\sqrt{n}}$ ✓

(b) $\frac{\sigma^2}{\sqrt{n}}$

(c) $\frac{\sigma^2}{n}$

(d) $\frac{\sigma^2}{2n}$

7. Precision is the reciprocal of :

(a) Arithmetic mean.

(b) Median.

(c) Variance. ✓

(d) Correlation coefficient.

8. Type II error is :

(a) Accepting a false null hypothesis. ✓

(b) Accepting a true null hypothesis.

(c) Rejecting a false null hypothesis.

(d) Rejecting a true null hypothesis.

9. When population variance is unknown and sample size is small, to test the significance of the mean, we use :

(a) t -test. ✓

(b) F-test.

(c) Normal test.

(d) Chi-square test.

10. To test the equality of variance, the test used is :

(a) t -test.

(b) F-test. ✓

(c) Paired t -test.

(d) Chi-square test.

11. To test the goodness of fit, we use :

(a) t -test.

(b) F-test.

(c) Paired t -test.

(d) Chi-square test. ✓

12. ANOVA to test significance we use :

(a) t -test.

(b) F-test. ✓

(c) Normal test.

(d) Chi-square test.

(12 × ¼ = 3 weightage)

Part B (Very Short Answers)

Answer any five questions.

Each question carries a weight of 1.

13. For a Binomial distribution mean is 12 and variance is 3. Find (i) p , (ii) n , and (iii) P (at least one success).
14. Define Poisson distribution and give its properties.
15. Define normal distribution.
16. State Central limit theorem.

17. What is meant by sampling distribution ? ✓
18. What is meant by interval estimation ? ✓
19. Define power of a test. ✓
20. Distinguish between null hypothesis and alternative hypothesis. ✓

(5 × 1 = 5 weightage)

Part C (Short Answers)

Answer any **eight** questions.
Each question carries a weight of 2.

- ✓ 21. Define Poisson distribution and explain its properties. ✓
- ✓ 22. Explain the area property of normal distribution. ✓
- ✓ 23. Define log normal distribution. Give their applications in Economics. ✓
- ✓ 24. Explain the terms unbiasedness and efficiency. ✓
25. Distinguish between (i) Level of significance and power of a test, (ii) Large sample tests and small sample tests.
26. Define critical region. What is meant by p -value ? ✓
27. Distinguish between one tailed and two tailed test. ✓
28. Explain the procedure of testing of equality of means.
29. Based on a random sample of size 10 from a normal distribution the mean and variance obtained are 12 and 25 respectively. Can it be regarded as a sample from a population with mean 15.
- ✓ 30. Explain Chi-square test for goodness of fit. ✓
31. What is meant by ANOVA ? Give model for one-way ANOVA. What are its assumptions ?

(8 × 2 = 16 weightage)

Part D (Essays)

Answer any **three** questions.
Each question carries a weight of 4.

32. Define t , F and Chi-square distributions and give their applications in testing of hypothesis.
33. The heights of 10 males of a locality are found to be 70, 67, 62, 68, 62, 68, 70, 64, 64, 66 inches. Is it reasonable to believe that the average height is greater than 64 inches ? Also find 95 % confidence limits for the mean height ?
34. Test whether the following two samples are taken from same normal population :

Sample 1 :	60	62	70	72	75	80	82	86	
Sample 2 :	62	63	67	85	78	83	85	86	88

Turn over

35. 1,000 families are selected at random in a city to test the belief that high income families usually send their children to public schools and the low income families often sent their children to government school. The following results were obtained :

Income	School		Total
	Public	Government	
Low	370	430	800
High	130	70	200
Total	500	500	1000

$$\frac{(\sum O_i - E_i)^2}{E_i}$$

Test whether income and type of schooling are independent.

36. Test whether the given varieties and treatments are homogeneous :

Treatments	1	2	3	4	5	6
Variety 1	68	62	72	74	75	74
Variety 2	64	63	68	75	78	73
Variety 3	68	66	62	72	70	76

(3 × 4 = 12 weightage)