

SECOND SEMESTER M.A. DEGREE EXAMINATION, JUNE 2017

(CUCSS-PG)

Economics

ECO 2C 07—QUANTITATIVE TECHNIQUES—II

(2010 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

*Answer all the questions.**Weightage 1.*

- If X is a discrete random variable, and $F(x)$ is the cumulative density function, then the probability mass function $p(x)$ is :
 - $F(x) - F(x+0)$.
 - $F(x) - F(x-0)$.
 - $F(x+0) - F(x)$.
 - $F(x+0) - F(x-0)$.
- For a random variable X , $E(X)$ is 10 and $\text{Var}(X)$ is 4 then $E(2X - 1)$ is :
 - 21.
 - 39.
 - 19.
 - 16.
- A distribution for which mean is greater variance :
 - Poisson.
 - Binomial.
 - Exponential.
 - Geometric.
- For a Poisson distribution modal values are 5 and 6 then variance is :
 - 12.
 - 6.
 - 3.
 - $\sqrt{6}$.
- If the distribution of X is normal with mean 0 and variance 1 with $P(0 \leq X \leq 1) = 0.3413$, the value of $P(|X| \geq 1)$ is :
 - 0.3174.
 - 0.3413.
 - 0.6826.
 - 0.1587.

Turn over

6. If X and Y are independent normal variates with mean 1 and -1 and standard deviation 4 respectively. Then $Z = X - Y$ is normal with :
- Mean 2 and standard deviation -1 .
 - Mean 2 and standard deviation 5.
 - Mean 0 and standard deviation 1.
 - Mean 2 and standard deviation 13.
7. The square of a standard normal variate is :
- F.
 - t .
 - Chi-square.
 - Geometric.
8. Standard error of sample mean is :
- $\frac{\sigma^2}{\sqrt{n}}$.
 - $\frac{\sigma}{\sqrt{n}}$.
 - $\frac{\sigma^2}{n}$.
 - $\frac{\sigma^2}{2n}$.
9. Type-I error is the error committed by :
- Accepting a false null hypothesis.
 - Accepting a true null hypothesis.
 - Rejecting a false null hypothesis.
 - Rejecting a true null hypothesis.
10. For testing a simple H_0 against simple H_1 , Neymann Pearson lemma gives :
- Size of the critical region.
 - The best critical region.
 - Uniformly most powerful critical region.
 - One tailed test.
11. $1 - P$ (Type - II error) is :
- Lever.
 - Power.
 - Confidence limit.
 - Size of critical region.
12. Critical region having maximum power is called :
- Confidence interval.
 - Uniform critical region.
 - Most powerful critical region.
 - Uniformly powerful critical region.

Part B

Answer any eight questions. Weightage 2.

13. What do you mean by probability distribution function (i.e. P.F.)? Also give the properties of a distribution function.
14. If X assumes values 1, 0 and -1 with equal probabilities, then find the mean and variance of X .
15. For a binomial distribution mean is 8 and variance is 4. Find (i) $P(X = 2)$, (ii) P (at least one success).
16. Define Poisson distribution and binomial distribution. Give their properties.
17. Define a normal distribution and explain its area property.
18. Define log normal distribution and give its applications in mathematical economics.
19. What is meant by sampling distribution and give the sampling distribution of sample mean?
20. Explain how Chi-square, t and F distributions are interrelated.
21. Mention two uses of F -distribution in testing of hypothesis.
22. Distinguish between point estimation and interval estimation.
23. Define an unbiased estimator. Show that an unbiased estimator need not be unique.
24. Define critical region. What is meant by p -value?

(8 × 2 = 16 weightage)

Part C

Answer any two questions. Weightage 4.

25. Define mathematical expectation. The probability that there is at least one error in an accounts statement prepared by A is 0.4 and for B and C they are 0.3 and 0.5 respectively. A, B and C prepared 10, 16 and 20 statements respectively. Find the expected number of correct statements in all.
26. Eight coins were tossed at a time 256 times. Number of heads observed at each throw is recorded and the results are given below. Find the expected frequencies. What are the theoretical values of mean and standard deviation? Calculate also the mean and standard deviation of the observed frequencies:

No. of heads at a throw :	0	1	2	3	4	5	6	7	8
Frequency :	2	6	30	52	67	56	2	10	1

Turn over

27. (a) Explain the properties and importance of normal distribution.
(b) Define Chi-square distribution. Give its properties and uses.
28. (a) Explain confidence interval. Explain how you construct confidence interval for proportion.
(b) A random sample of 25 observations from a population with variance 2.25 cm of 2.5 cm. Calculate 99 percentage confidence interval for the population mean.
(2 × 4)