C 44169 (Pages : 3) Name.....

Reg. No.....

SECOND SEMESTER M.A. DEGREE EXAMINATION, AUGUST 2013

(CUCSS)

Economic

QUANTITATIVE TECHNIQUES—II

(2010 Admissions)

Time : Three Hours Maximum : 36 Weightage

Part A

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

(A) Multiple Choice Questions :

1. For a binomial distribution mean is 6 and variance is 2 then n is :

   (a) 12. (b) 9.

   (c) 3. (d) 6.

2. Standard error of sample mean is :

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

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

3. The error committed by accepting a false null hypothesis :

   (a) Type-I error. (b) Type-II error.

   (c) Level of significance. (d) Power of the test.

4. In ANOVA we test :

   (a) The equality of several variances. (b) The equality of several means.

   (c) Significance of mean. (d) Significance of variance.

(B) Multiple Choice Questions :

5. If A and B are mutually exclusive events, then $P(A \cup B)$ is :

   (a) $P(A) - P(B) - P(A \cap B)$. (b) $P(A) + P(B)$.

   (c) $P(A) - P(B) + P(A) \cdot P(B)$. (d) $P(A) - P(B)$.

Turn over

6. A distribution for which mean is always greater than variance :

(a) Poisson. (b) Binomial.

(c) Normal. (d) Uniform.

7. To test the significance of proportion, we use :

(a) t-test. (b) F-test.

(c) Normal test. (d) Chi-square test.

8. When population variance is known 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.

(C) Fill in the blanks :

9. For a Poisson distribution with parameter 2, standard deviation is :

10. The functions representing population characteristics are called.

11. If the random variable X has a normal distribution with mean 10 and variance 2. Then the distribution of $Y = 2X + 5$ is :

12. To test the significance of proportion, the test used is :

(D) State whether the following statements are True *or* False :

13. The square of a standard normal variate is a Chi-square variate.

14. The variance of a standard normal distribution is zero.

15. Probability of type-II error is called power.

16. An estimator t is unbiased for θ, if the mean of its sampling distribution is θ.

($4 \times 1 = 4$ weightage)

Part B

Answer any **ten** *questions.*
Each question carries a weightage of 2.

17. Define mathematical expectation. What are its properties ?

18. 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 0.6 respectively. A, B and C prepared 10, 16 and 20 statements respectively. Find the expected number of correct statements in all.

19. For a Poisson distribution mean is 4 and standard deviation is 2. Find (a) $P(X = 1)$, (b) P (at least one success) and (c) Skewness.

20. Define log normal distribution. Give its importance and applications in Economics.

21. Define Chi-square distribution. Give its properties and uses.

22. What is meant by sampling distribution ? Give the sampling distribution of sample mean. What is the standard error of sample mean.

23. Define the terms : (a) parameter, (b) statistic, (c) estimator ; and (iv) estimate.

24. Define point estimation and interval estimation.

25. Define Statistical hypothesis and distinguish between simple and composite hypothesis.

26. Distinguish between (a) null hypothesis and alternative hypothesis ; (ii) Type-I error and type-II error.

27. Define level of significance and power of a test.

28. Explain the procedure of testing of hypothesis.

29. Distinguish between large sample test and small sample test ?

30. Explain Paired t-test.

(10 × 2 = 20 weightage)

Part C

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

31. Describe Normal distribution ? Describe the properties and importance of normal distribution ?

32. A random sample of size 26 has 55 as mean. The sum of the squared deviations from the mean is 494. Can the sample be regarded as taken from the population having 50 as mean. Also find probable limits in which the mean is expected to lie.

33. (a) What is meant by estimation ? Discuss the desirable properties of a good estimator.

(b) Show that sample mean is unbiased for population mean on the basis of a random sample of size n from $N(\mu, \sigma^2)$.

34. From the following data test whether the two samples are taken from same normal population.

Sample 1	:	63	62	72	74	75	82	85	87	90
Sample 2	:	62	63	67	75	78	83	85	84	86

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

Item 1	:	23	22	26	24	25	28	20	27	25
Item 2	:	24	23	27	25	28	23	25	28	30
Item 3	:	28	20	24	20	28	20	22	16	16

(3 × 4 = 12 weightage)