SECOND SEMESTER M.A. DEGREE EXAMINATION, APRIL 2020
(CUCSS - PG)
CC19P ECO2 C08 - QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS II
(Economics)
(2019 Admission - Regular)

Time: Three Hours   Maximum: 30 Weightage

Part A
Answer *all* questions. Each question carries 1/5 weightage.

1. If A is an event defined over a sample space S then P(A/S) = ………….

   a) 0   b) 1   c) A   d) None

2. If $F(x)$ is the distribution function of a random variable X, then $F(-\infty) =$ ………….

   a) 0   b) 0.5   c) 1   d) ∞

3. If $E(X) = 4$, then $E(3X - 2) =$ ………

   a) 4   b) 16   c) 10   d) 8

4. Poisson distribution is a ………….. distribution.

   a) Continuous   b) Discrete   c) Symmetric   d) None

5. Mean, median and mode are equal for a ………….. distribution.

   a) Binomial   b) Normal   c) Poisson   d) Lognormal

6. If X follows binomial distribution with n = 1 and p = 0.5, then E(X) = …………..

   a) 0.5   b) 1   c) 0   d) 0.25

7. The statistic for testing   goodness of fit is using ………….. distribution

   a) Chi-square distribution   b) Normal distribution

   c) Uniform distribution   d) Exponential

8. In ANOVA, the test is concerning equality of …………..

   a) mean   b) variance   c) proportion   d) None

9. The hypothesis under test is called …………..

   a) Alternative hypothesis   b) Simple hypothesis

   c) Null hypothesis   d) All the above

10. The mean of a random variable that follows Poisson distribution is always …………..
    variance.

    a) less than   b) greater than   c) square root of   d) equal to

11. If X follows normal distribution with mean 30 and standard deviation 5 its frequency curve will be symmetric about X = …………..

    a) 5   b) 30   c) 25   d) 0

State whether the following statements are true or false.

12. Binomial distribution is always unimodal

13. Normal distribution is an asymmetric curve.

14. In χ^2 follows Chi-square distribution with 3 degrees of freedom, then $E(\chi^2) = 3$

15. Sample mean is an unbiased estimator of population mean.

(15 x 1/5 = 3 Weightage)

Part B (Very Short Answer Type)
Answer any *five* questions. Each question carries 1 weightage.

16. Define axiomatic approach to probability

17. Define Poisson distribution and its properties.

18. In a binomial distribution mean and variance are 3 and 2 respectively. Find 'n' and 'p'.

19. Define Binomial distribution

20. What are the uses of Normal distribution?

21. What are the desirable properties of a good estimator?

22. Explain the terms a) null and alternative hypothesis b) power of the test

23. Define Type I and Type II errors.

(5 x 1 = 5 Weightage)

Part C (Short Answer Type)
Answer any *seven* questions. Each question carries 2 weightage.

24. State and prove addition theorem on probability

25. A random variable X has probability mass function

$$p(x) = \begin{cases} \frac{k}{3}, & x = 1 \\ \frac{k}{10}, & x = 2 \\ \frac{k}{4}, & x = 3 \end{cases}$$

    Find i) k   ii) $P(X = 1)$

26. Let X be the number of heads obtained when a coin is tossed three times. Find E(X)

27. Derive the mean of Poisson distribution

28. Explain unbiasedness and consistency properties of an estimator.

29. Distinguish between point estimation and interval estimation.

30. Write any three properties of chi-square distribution and two applications.

31. What is the importance of lognormal distribution?

32. Distinguish between parametric and non parametric test.

33. Explain a) standard error b) sampling distribution.

(7 x 2 = 14 Weightage)

Part D (Essay Answer Type)
Answer any *two* questions. Each question carries 4 weightage.

34. a) Explain Bayes theorem

    b) Three machines A, B, C produce respectively 60, 30 and 10 percentage of total production of a factory. A produces 2% B produces 3 % and C produces 4 % defectives. An item is selected at random. i)   What is the probability that it is defective. ii) If the item is defective, what is the probability that it is produced by machine C

35. a) Define normal distribution and what are its chief properties.

    b) In an IQ test given to 1000 children the average score is 56 and standard deviation 22. Find the number of children with IQ score

        i) exceeding 70

        ii) less than 40

        iii) between 60 and 80.

36. The mean lifetime of a sample of 400 fluorescent light bulbs produced by a company is found to be 1570 hours with a standard deviation of 150 hours. Test the hypothesis that the mean life of the bulbs produced by the company is 1550 hours against the alternative hypothesis that it is greater than 1550 hours at 5% level of significance.

37. Achievement test scores of trainees under three methods of instruction are given below

A	82	71	73	68	81
B	90	86	88	76	85
C	85	76	84	71	84

Using ANOVA at 5% significance level verify whether means of the three populations from which the samples are drawn are equal

(2 x 4 = 8 Weightage)

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