19P263S (Pages: 3) Name…….

Reg. No……...……..

SECOND SEMESTER M.A. DEGREE EXAMINATION, APRIL 2020

(CUCSS - PG)

CC15P ECO2 C08 – QUANTITATIVE METHODS FOR ECONOMIC ANALYSIS II

(Statistics)

(2015 to 2018 Admissions - Supplementary/Improvement)

Time: Three Hours Maximum: 36 Weightage

PART A

Answer ***all*** questions. Each question carries 1weightage.

1. For the probability mass function $f(x) = k$; for $x = 1,2,3,4,5,6$, the value of k is

   a) 1 b) $\frac{1}{2}$ c) $\frac{1}{6}$ d) $\frac{1}{5}$

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 X and Y are two random variables such that $E(X) = 2$ and $E(Y) = 3$,then $E(X + Y)$ is

   a) 5 b) 13 c) 10 d) 6

4. The frequency curve of binomial distribution with parameters n and p will be symmetric if

   a) p=q b) p < q c) p> q d) p≠q

5. If X follows Poisson distribution with mean 2.35, then its mode will be at X =……

   a) 2 b) 3 c) 4 d)1

6. A normal distribution is……

   a) symmetric b) positively skewed c) negatively skewed d) none of these

7. The standard deviation of a statistic is called ……..

   a) standard error b) mean deviation c) quartile deviation d) coefficient of variance

8. For χ^2 distribution with 3 degrees of freedom, variance is

   a) 3 b) 2 c) 9 d) 6

9. A students t curve is symmetric about ……..

   a) t = 0 b) t = 1 c) t = n d) None of these

10. An estimator is a function of …….

    a) Population observations b) Sample observations

    c) Mean and variance of the population d) None of these

11. The hypothesis $H_0 : \theta > \theta_0$ is a ……

a) Simple hypothesis b) Composite hypothesis

c) Alternate hypothesis d) None of these

12. Analysis of variance deals with testing equality of

a) mean b) variance c) standard deviation d) median

(12 × ¼ = 3 Weightage)

PART B (Very Short Answer Questions)

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

13. Distinguish discrete and continuous random variable
14. Define distribution function of a random variable.
15. If the mean variance of binomial distribution are 3 and 2 respectively find p
16. Define sampling distribution
17. Define statistic. Give suitable examples
18. Define consistency of an estimator
19. Define interval estimator
20. Define power of a statistical test.

(5 × 1 = 5 Weightage)

PART C (Short Answer Questions)

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

21. A random variable X has probability mass function given by $P(X = 1) = \frac{k}{2}$, $P(X = 2) = \frac{k}{4}$ and $P(X = 3) = k$. Find k.
22. Define mathematical expectation and give any two properties of it
23. Let X be the number of heads obtained when a coin is thrown three times Find E(X)
24. Derive the mean of Poisson distribution
25. What are the properties and applications of lognormal distribution?
26. Write any two properties of student's t distribution. State its important uses.
27. Explain maximum likelihood estimation. What are the properties of maximum likelihood estimators?
28. Distinguish between (i). Simple and Composite hypothesis (ii) Null and Alternative hypothesis

29. Distinguish between small sample and large tests. Give examples of small sample test and large sample tests.
30. In a sample of 100 people the number of those suffering from T.B was found to be 5. Does this contradict the assumption that the proportion of T.B patients in the whole population is less than 0.04?
31. The height of students studying in college classes is believed to be distributed with S.D 1.5. A sample of 400 students have their mean height 4.75 ft. Does this contradict the hypothesis that the mean height of students is 4.48 ft. (significance level 0.01)

(8 × 2 = 16 Weightage)

PART D (Essay Questions)

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

32. a) Define normal distribution and give its four chief properties

b) Average IQ of a group of 400 children is 95. The standard deviation is 6. Assuming normality, find the expected number of children having IQ between 100 and 120.

33. A stenographer claims that she can take dictation at rate of 120 words per minute. Can we reject her claim on the basis of 100 trials in which she demonstrated a mean of 116 words with a standard deviation of 15 words at 5 % level of significance?
34. Explain different methods of estimation.
35. Samples of sizes 10 and 14 were taken from two normal populations with standard deviations 3.5 and 5.2 and the sample means were found to be 20.3 and 18.6. Test whether the means of the two populations are the same at 5% level.
36. (a) Explain clearly the technique of analysis of variance with two-way classification.

(b) The following data relates to the yield of four varieties of wheat each sown, on 5 plots. Find whether there is a significant difference between the mean yield of these varieties

Varieties

Plot	**A**	**B**	**C**	**D**
I	99	103	109	104
II	101	102	103	100
III	103	100	107	103
IV	99	105	97	107
V	98	95	99	106

(3 × 4 = 12 Weightage)

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