19U265S (Pages: 3) Name: …………………..….

Reg. No: …...………..……..

SECOND SEMESTER B.C.A DEGREE EXTERNAL EXAMINATION, APRIL 2020

(CUCBCSS - UG)

CC15U BCA2 C03 – COMPUTER ORIENTED STATISTICAL METHODS

(Complementary Course)

(2015, 2016 Admissions - Supplementary)

Time: Three Hours Maximum: 80 Marks

Part A

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

1. The correlation between X and Y is:

   (a) -1 and +1 (b) -1 and 0 (c) 0 and +1 (d) None of the above.

2. Rank correlation is due to:

   (a) A.N Kolmogorov (b) Charles Spearman

   (c) R. A. Fisher (d) Karl Pearson.

3. For a Binomial distribution which of the following is true?

   (a) Mean > Variance (b) Mean < Variance

   (c) Mean = Variance (d) Mean >= Variance.

4. A hypothesis which completely specifies the distribution is:

   (a) Composite hypothesis (b) Null hypothesis

   (c) Simple hypothesis (d) Alternate hypothesis

5. If X_1 and X_2 are two independent standard normal variables, then the ratio of their squares follows

   (a) Chi-square distribution (b) F distribution

   (c) Normal distribution (d) Binomial distribution

Fill in the blanks:

6. Best measure of central tendency is ………………
7. The total number of possible outcomes in any trial of a random experiment is known as ……………… events.
8. If A and B are two independent events then P(A ∩ B) = ………………
9. The rejection region is also known as ………………
10. The probability of Type 1 error is called ………………

(10 x 1 = 10 Marks)

Part B

Answer ***all*** questions. Each question carries 2 marks.

11. Define standard deviation
12. Define correlation.
13. What is meant by sample space?
14. Define mathematical expectation.
15. What do you mean by sampling distribution?

(5 x 2 = 10 Marks)

Part C

Answer any ***five*** questions. Each question carries 4 marks.

16. Find the A.M and Median of the following data:-

Class :	0 – 10	10 – 20	20 – 30	30 – 40	40 - 50
Frequency :	5	12	14	11	8

17. Find the constant c such that the function

$$f(x) \quad = \begin{cases} cx^2 , 0 \ < x \ < 3 \\ 0 \ otherwise \end{cases}$$

otherwise. is a density function, and compute P $(1 < X < 2)$.

18. Define distribution function and list its properties.
19. Derive the m.g.f of the Binomial distribution. Hence find its mean and variance.
20. Establish the relation between raw and central moments.
21. Explain the method of maximum likelihood.
22. Define χ^2 and F distributions.
23. Distinguish between point and interval estimate. Obtain the 95% confidence interval for the mean of the Normal distribution.

(5 x 4 = 20 Marks)

Part D

Answer any ***five*** questions. Each question carries 8 marks.

24. Compute Karl Pearson's correlation coefficient and obtain the lines of regression.

X :	68	64	75	50	64	80	75	40	55	64
Y :	62	58	68	45	81	60	68	48	50	70

25. Explain the principle of least squares. Fit a straight line to the following data

X :	1	3	5	7	9	11	13	15
Y :	3	11	20	28	35	45	53	60

26. If $f(x) = e^{-(x+y)}, x \geq 0, y \geq 0 = 0$, otherwise be the joint density function of X and Y. Find the conditional density function of

(a) X given Y (b) Y given X.

27. Derive the recurrence relation for the Normal distribution and hence obtain the variance.
28. Find the probability that in tossing a fair coin three times, there will appear

(a) three heads (b) two tails and one head

(c) at least one head (d) not more than one tail.

29. If the heights of 300 students are normally distributed with mean 68 inches and standard deviation 3 inches, how many students have heights (a) greater than 72 inches (b) less than or equal to 64 inches (c) between 65 and 71 inches.
30. A machine produces bolts which are 10% defective. Find the probability that in a random sample of 400 bolts produced by this machine, (a) at most 30 (b) between 30 and 50 (c) between 35 and 45 (d) 65 or more, of the bolts will be defective.
31. Explain the desirable properties of good estimate. Give examples.

(5 x 8 = 40 Marks)

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