17U142 (Pages: 2) Name:……………………

Reg.No…………………..

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2017

(Regular/Supplementary/Improvement)

(CUCBCSS-UG)

CC15UST1C01 – BASIC STATISTICS AND PROBABILITY

(Statistics- Complementary Course)

(2015 Admission Onwards)

Time: Three Hours Maximum: 80Marks

SECTION A

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

1. If the cumulative distribution function of is F( ). Then the cumulative distribution function of = + is---------.

2. The range of variation of the distribution function F(x) is----.

3. Coefficient of correlation is the -----------of regression Coefficients.
4. If A and B are two independent events such that P(A) = 0.45, P(B) = 0.35, then ---------
5. The relationship between A.M., G.M. and H.M. is ----------

Write True or False

6. Regression coefficients are invariant of change of origin and scale.
7. If , then P(A) P(B)
8. The most stable measure of central tendency is mode
9.
10. All distribution functions are monotonically non decreasing.

(10x1= 10 Marks)

SECTION B

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

11. The two regression lines are $X + 2Y - 5 = 0$ and $2X + 3Y - 8 = 0$. Find mean

values of X and Y.

12. If = and = and P(A) = P(B) = p, then find the value of p
13. Show that sum of squares of deviations of observations about the arithmetic mean is minimum.

14. A continuous random variable X has the p.d.f. $f(x) = k\, x_2$, $0 \leq x \leq 1$. Find k

15. Explain the Method of least squares.
16. Define a random variable
17. Define Coefficient of Variation. Give any one of its uses.

(7 x 2 = 14 Marks)

SECTION C

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

18. Give axiomatic definition of Probability.
19. Show that standard deviation is invariant under change of origin but not of Scale.
20. Define Multiple and Partial correlation.

21 Explain the method of fitting a power curve =

22 A random variable X has p.d.f $f(x) = 1$, $0 \leq X \leq 1$ find the pdf of $Y = -2 \log X$.

(4 x 3= 12Marks)

SECTION D

Answer any ***four*** questions. Each question carries 6 marks.

23 (a) State and prove addition theorem of probability.

(b) If a number is selected from the first 100 natural numbers find the probability that it is a multiple of 6 or 8.

24 Distinguish between Probability density function and Probability mass function.

25 If is the random variable representing number of heads in tossing three unbiased coins, write distribution function of and sketch the graph of distribution function.

26 Obtain the equation of the line of regression of on and find the expression for the angle between the regression lines.

27 If p(x) = is a pmf find i) k ii) P(1 < x < 4)

28 Calculate the rank correlation for the following data

x	90	82	82	82	81	71	63	63	49	38
y	75	72	71	71	71	71	50	40	32	32

(6 x4 = 24Marks)

SECTION E

Answer any ***two*** questions. Each question carries 10 marks.

29 (a) State and Prove Baye's Theorem. (b) Three Machines X, Y and Z with production capacities in the ratio 2:3:4 are producing bullets. The probabilities that the machines produce defectives are 0.1, 0.2, and 0.3 respectively. A bullet is taken from a day's production and found to be defective. What is the Probability that it is produced by machine C.?

30 Given Find the pdf of i) Y = ii) Y = -3X + 7

31 For a random variable X with probability density function $f\ (x)\ = Kx(2-x)\ , 0 \leq X \leq 2$

i) Find K ii) P(X 1.5) iii) iv) P(X = 0.5)

32 Explain "rank correlation". Derive the formula for Spearman's rank correlation coefficient.

(2X10 = 20Marks)

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