19U257 (Pages: 3) Name: …….……

Reg. No: ……..……

SECOND SEMESTER B.Voc. DEGREE EXAMINATION, APRIL 2020

(Regular/Supplementary/Improvement)

CC17U ST1 C01/CC18U GEC2 ST06 – BASIC STATISTICS AND PROBABILITY

(B.Voc. Information Technology)

(2018 Admission onwards)

Time: Three Hours Maximum: 80 Marks

Part A

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

Fill up the blanks:

1. ……. is a measure of dispersion which uses only extreme values.
2. The measure of central tendency which divides the distribution under a frequency into two equal parts is …….
3. The range of Spearman's rank correlation coefficient is …….
4. The axiomatic definition of probability was given by …….
5. If A and B are independent events, then P(A/B) = …….

Write true or false:

6. The best average used for index numbers is harmonic mean.
7. Arithmetic mean is unaffected by the change of origin.
8. The term "regression" was introduced by Sir Francis Galton.
9. If F(x) is the distribution function of a random variable X. Then $F(+\infty) = 0$.
10. Sample space is the set of all possible outcomes of a random experiment.

(10 x 1 = 10 Marks)

Part B

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

11. What is geometric mean?
12. List any two partition values.
13. Distinguish between population and sample.
14. State the properties of arithmetic mean.
15. Write down the empirical relation between mean, median and mode.
16. Define mean deviation.
17. Define axiomatic definition of probability.

18. What is a scatter diagram?

19. Identify a situation where rank correlation is used.

20. Give an example for a discrete random variable.

21. Define probability density function of a random variable.

22. State the multiplication theorem of any two events.

(8 x 2 = 16 Marks)

Part C

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

23. What are the desirable properties of an ideal measure of dispersion?

24. Distinguish between multiple correlation and partial correlation.

25. Compute the mode for the given data:

Class Interval	0-20	20-40	40-60	60-80	80-100
Frequency	8	21	35	31	5

26. Show that the standard deviation is independent of the change of origin but not of the scale.

27. Prove that the correlation coefficient lies between -1 and +1.

28. State and prove addition theorem of two events.

29. The two regression lines are Y = 100.26 + 0.77X and X = 1.28Y – 143.7. Find $\bar{X}, \bar{Y}$ and correlation coefficient between X and Y.

30. A card is drawn from a well-shuffled pack of playing cards. What is the probability that it is either a spade or an ace?

31. Define distribution function. What are its properties?

(6 x 4 = 24 Marks)

Part D

Answer any ***two*** questions. Each question carries 15 marks.

32. (a) Explain the principle of least squares.

(b) Fit a curve of the form Y = aX + b for the following data

Weight	50	70	100	120
Height	12	15	21	25

33. (a) State and prove Baye's theorem.

(b) Three groups of children contain respectively 3 girls and 1 boy, 2 girls and 2 boys, 1 girl and 3 boys. One child is selected at random from each group. Show that the chance that the three selected consist of 1 girl and 2 boys is 13/32.

34. Lives of two models of refrigerators turned in for new models in a recent survey are:

Life(No: of Years)	Model A	Model B
0-2	5	2
2-4	16	7
4-6	13	12
6-8	7	19
8-10	5	9
10-12	4	1

What is the average life of each model of these refrigerators? Which model shows more uniformity?

35. (a) A random variable X has density $f(x) = k\,x^2 e^{-x^3}, x > 0$. Find the density of $Y = X^3$.

(b) Check whether the following is a p.d.f $f(x) = 2x, 0 \leq x < 1$

$= 4 - 2x, 1 \leq x < 2$

$= 0$, else where

(2 x 15 = 30 Marks)

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