

**21U277S**

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Name: .....

Reg. No: .....

**SECOND SEMESTER B.Voc. DEGREE EXAMINATION, APRIL 2022**

(B.Voc.– Information Technology)

**CC18U GEC2 ST06 /CC15U ST1 C01 - BASIC STATISTICS AND PROBABILITY**

(2018 to 2020 Admissions - Supplementary/Improvement)

Time: Three Hours

Maximum: 80 Marks

**Part A**

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

Fill up the blanks:

1. The average used for income distribution is .....
2. The measure of central tendency which divides the distribution under a frequency into ten equal parts is .....
3. The range of correlation coefficient is .....
4. If A and B are independent events, then  $P(A \cup B) = \dots\dots\dots$
5. The term “regression” was introduced by .....

Write true or false:

6. The best average used for index numbers is harmonic mean.
7. Tied ranks are used for qualitative data.
8. The axiomatic definition of probability was given by R. A. Fisher.
9. If  $F(x)$  is the distribution function of a random variable X. Then  $F(+\infty) = 0$ .
10. Number of heads appeared while tossing a coin is an example of discrete random variable.

**(10 × 1 = 10 Marks)**

**Part B**

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

11. Define range.
12. List any two partition values.
13. Distinguish between population and sample.
14. What is coefficient of quartile deviation?
15. Write down the relation between AM, GM & HM.
16. Define mean deviation about an average.
17. Define classical definition of probability.
18. What is a scatter diagram?
19. What are tied ranks?
20. Define random variable.
21. Define probability density function of a random variable.
22. State the multiplication theorem of any two events.

**(8 × 2 = 16 Marks)**

**Part C**

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

23. Explain the terms (i) Mutually exclusive events (ii) Exhaustive events.

24. Distinguish between multiple correlation and partial correlation.

25. Compute the mean for the given data:

Class Interval	0-10	10-20	20-30	30-40	40-50
Frequency	5	17	25	20	6

26. Show that the standard deviation is independent of the change of origin.

27. State and prove addition theorem of two events.

28. Show that pairwise independence need not imply mutual independence.

29. The two regression lines are  $4x - 5y + 33 = 0$  and  $20x - 9y = 107$ . Find the mean values of  $x$  and  $y$ . Also compute the 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. A random variable  $X$  has density  $f(x) = k, -2 \leq x \leq 12, .$  Find  $k$  and the cumulative distribution function  $F(x)$ .

**(6 × 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) From a survey it is found that the probability of selecting (i) a male or a smoker is already selected is  $2/3$  (ii) a male smoker is  $2/5$  (iii) a male, if a smoker is already selected is  $2/3$ . Find the probability of selecting (a) a non-smoker male (b) a male (c) a smoker, if a male is first selected.

34. Goals scored by two teams A and B in a football season were as follows:

No: of goals scored in a match	No: - of matches	
	A	B
0	27	17
1	9	9
2	8	6
3	5	5
4	4	3

Find out which team is more consistent.

35. Obtain the two regression lines and hence find the correlation coefficient 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

**(2 × 15 = 30 Marks)**

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