

Tribhuvan University
Institute of Science and Technology

2078

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Bachelor Level/First Year/Second Semester/Science

Full Marks: 60

Bachelors in Information Technology (STA 154)

Pass Marks: 24

(Basic Statistics)

Time: 3 Hours

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Section A

Long Answer Questions

Attempt any TWO questions.

[2x10=20]

1. What are different methods of measuring dispersion? Following are the marks of Basic Statistics obtained by two students A and B in 10 tests of 100 marks each. [10]

Test	1	2	3	4	5	6	7	8	9	10
Mark of A	44	80	76	48	52	72	68	56	60	54
Mark of B	48	75	54	60	63	69	72	51	57	66

- (i) Who is better? (ii) If the consistency of performance is the criteria for awarding a prize, who should get the prize?
2. The following data gives the experience of Computer Operators in years and their performance as given by the number of good parts turned out per 100 pieces. [10]

Experience(X)	16	12	18	4	3	10	5	12
Performance(Y)	87	88	89	68	78	80	75	83

- (a) Fit the regression equation of performance rating in experience.
- (b) Estimate the probable performance of an operator had 8 years of experience and interpret regression coefficient.
3. Define standard normal distribution. For a certain type of computers, the length of time between charges of the battery is normally distributed with a mean of 50 hours and a standard deviation of 15 hours. He owns one of these computers and wants to know the probability that the length of time will be (i) between 50 and 70 hours, (ii) more than 60 hours, and (iii) less than 45 hours? [10]

Section B

Short Answer Questions

Attempt any EIGHT questions.**[8x5=40]**

4. What is measurement of scale? Describe different types of measurement scale. [5]
5. The following table shows the numbers of hours spent by a child on different events on a working day. Represent the adjoining information on a pie chart. [5]

Activity	No. of hours
School	6
Sleep	8
Playing	2
Study	4
T.V.	1
Others	3

6. Define correlation coefficient? Calculate the co-efficient of correlation for the following ages(in years) of husbands and wives and interpret it. [5]

Husband's age X:	23	27	28	28	29	30	31	33	35	36
Wife's age Y:	18	20	27	21	29	27	27	29	28	29

7. Suppose a continuous random variable X has the density function. [5]

$$f(x) = \begin{cases} k(1-x)^2; & \text{for } 0 < x < 1 \\ 0; & \text{elsewhere} \end{cases}$$

Find; (i) value of k, (ii) $P(0 < x < 0.5)$, and, (iii) $E(X)$ and (iv) $E(2X + 4)$

8. During one stage in the manufacture of integrated circuit chips, a coating must be applied. If 70% of chips received a thick enough Coating. find the probability that among 15 chips (1) at least 12 will have thick enough coatings, and () exactly 10 will have thick enough coatings. [5]
9. Suppose that after 10 years of service, 40% of computers have problems with motherboards (MB), 30% have problems with hard drives (HD), and 15% have problems with both MB and HD. What is the probability that a 10-year old computer still has fully functioning MB and HD? [5]

10. The standard deviation of a symmetric distribution is 7. Compute the possible value of fourth central moment for the distribution to be (i) mesokurtic (ii) platykurtic, and (iii) leptokurtic. [5]
11. Describe sampling error and non-sampling error. [5]
12. Write short notes on the following: [2x2.5=5]
- a. Choice of appropriate measure of central tendency
 - b. Parameter and statistic