2023

BFSC 2nd Semester Examination

Statistical Methods

PAPER — BFSC-205

Full Marks : 50

Time : 2 hours

The figures in the right-hand margin indicate marks.

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

Illustrate the answers wherever necessary.

1. Answer *any* **ten** from the following questions : $2 \times 10 = 20$

   (a) Observe the marks secured by 20 students in a math test of 20 marks. Arrange the data in a frequency distribution table.

   10, 8, 9, 8, 10, 10, 11, 12, 14, 15

   8, 9, 7, 8, 10, 10, 11, 12, 10, 8

(Turn Over)

(b) Compute the mean of the following caudal fin length scores (mm) of a sample of fishes. 12·8, 11·7, 12·3, 10·8, 12·5, 11·4, 12·5, 10·9, 11·6, 11·7

(c) Find out the median from the following : 19, 21, 22, 26, 28, 30, 31, 35, 35, 37

(d) What is the formula for calculating the median of odd number of observations?

(e) Represent the following data into a cumulative frequency distribution table :

8 7 9 16 10 10 12 12 14 15 12
8 7 8 4

(f) Find out the modal value from the given data : 9, 3, 7, 8, 9, 10, 20, 6, 7, 8, 4

(g) What is conditional probability? How is it calculated?

(h) What is variable? Classify different types of variable.

(i) What is the probability of throwing a die once and rolling either a three or a four?

(j) Write down the formula of standard error of mean.

(k) The lowest and highest caudal fin length scores of a sample of fishes are 20 mm and 46 mm respectively. Find out the range.

(l) If the largest value is 'L' and the smallest value is 'S', then calculate the coefficient of range.

(m) If standard deviation is 9·23 and mean is 173, then what will be the variance?

(n) What is the relation among mean, median and mode?

(o) Calculate the median of the data given in the table.

x	60	70	80	90	100
f	2	4	6	8	1

2. Answer any **six** from the following questions : 5×6=30

(a) What are the advantages and disadvantages of Census and Sample Survey? 5

(b) 10 students were given intensive coaching in statistics. The scores obtained in first and fifth tests are given below :

Students	1	2	3	4	5	6	7	8	9	10
First Test	50	52	53	60	65	67	48	69	72	80
Fifth Test	65	55	65	60	67	49	82	74	86	

Does the score from the first test to fifth test show any improvement? 5
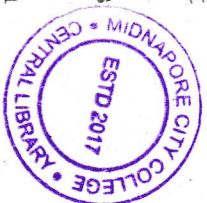
(c) Compute Pearson's 'r' using the following data to find whether or not there is a significant correlation between length (cm) and weight (kg) of 9 *catla catla* fishes.

$\Sigma X = 1509$, $\Sigma X^2 = 253343$, $\Sigma XY = 82344\cdot5$, $\Sigma Y = 409\cdot5$, $\Sigma Y^2 = 26910\cdot75$.   5

(d) State the importance of Chi-square test. What is Yates correction?   3+2=5

(e) From a field random sampling, the height (cm) of 13 plants are obtained. These are 161, 183, 177, 157, 181, 176, 180, 162, 163, 174, 179, 169, 187. Calculate the mean deviation, standard deviation and variance.   5

(f) What are the important measures of central tendency? Give their formulas, advantages and disadvantages.   1+4=5

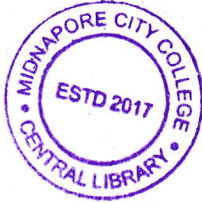(g) What are Skewness and Kurtosis? How are they measured and interpreted?   2+3=5

(h) What is length-weight relationship in fishes? How can it be applied using linear regression in fisheries?   2+3=5

(i) Write short notes on the following : 2½×2=5
    (i) Bar graph
    (ii) Pie diagram

(j) Discuss the methodology for estimation of marine fish landing at Digha coast from the statistical point of view.   5

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