

Set 3

25

Block 16

Room A-103

FYBA

Sem I

Statistics I

23rd Nov., 2016

3pm to 6pm

(03 pages)

Q.P. Code : 755205

(3 Hours)

(Total Marks: 100

- N.B. : (1) All Questions are compulsory.
(2) Use of Calculator is allowed.

Q 1. (a) Correct the following if necessary.

- (1) Religion is a variable. (10)
(2) Lower limit is excluded in case of exclusive type of class intervals. (02)
(3) Mode is the minimum value in the data. (02)
(4) Mean deviation is a measure of central tendency. (02)
(5) Standard deviation (S.D) is not based on all observations. (02)

Q 1. (b) Answer in one sentence.

- (1) What is meant by symmetric distribution? (10)
(2) State any two requirements of a good statistical table. (02)
(3) Define class boundaries and width of a class interval. (02)
(4) State when median is appropriate measure of central tendency. (02)
(5) Explain the role of range as a measure of dispersion. (02)

Q 2. Attempt any TWO sub-questions.

- (1) Describe different scales of measurement. (10)
(2) Discuss requirements of a good questionnaire. (10)
(3) What is primary data ? Explain in detail different methods of collecting primary data. (10)
(4) Find all ultimate class frequencies from the following data and tabulate them. (10)
(A) = 224, (B) = 301, (C) = 150, (AB) = 125, (AC) = 72, (BC) = 60,
(ABC) = 32, N = 800.

Q 3. Attempt any TWO sub-questions.

- (1) I) Write procedure of drawing (i) Histogram when classes are of equal and of unequal width (ii) Frequency Polygon. (10)
II) What are requisites of good measure of central tendency?
(2) I) Define (i) Decile, (ii) Percentiles, (iii) Quartiles. (10)
II) How will you obtain median for ungrouped and grouped data.
(3) Discuss merits and demerits of (i) Arithmetic Mean and (ii) mode. (10)
(4) I) What are demerits of geometric mean. (10)
II) Following data represent age distribution of 60 boys.

| Age in years | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 |
|--------------|-------|-------|-------|-------|-------|-------|
| No. of boys | 5 | 9 | 15 | 17 | 10 | 4 |

- (i) Obtain cumulative frequency distribution less than type (ii) Obtain seventh decile and (iii) thirty eighth percentile.

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Q 4. Attempt any TWO sub-questions.

- (1) Explain the concept of dispersion. Define quartile deviation and standard deviation. State their merits and demerits. (10)
- (2) (i) What is kurtosis? Explain different types of kurtosis. State the measure of kurtosis. (10)
- (ii) Given $\mu_1 = 0$, $\mu_2 = 40$, $\mu_3 = -100$, $\mu_4 = 200$, find β_1 and β_2 .
- (3) Define raw moments about origin zero and central moments. Derive relationship between first four central moments and raw moments about origin zero. (10)
- (4) (i) Obtain mean deviation about mean and coefficient of mean deviation about mean for the following data on time required to complete typing test. (10)

| | | | | | | |
|------------------|----|----|----|----|----|----|
| Duration in min. | 11 | 12 | 13 | 14 | 15 | 16 |
| No. candidates | 7 | 19 | 25 | 23 | 15 | 11 |

- (ii) What is the effect of change of origin and scale on raw moments?

Q 5. Attempt any FOUR sub-questions.

- (1) Explain the terms (i) dichotomous classification (ii) simple random sampling. (iii) qualitative data (iv) time series data. (05)
- (2) A survey in a certain locality revealed that out of 300 persons considered, 110 were attacked by a disease. Out of 300 persons, 160 had been vaccinated and of those only 50 were attacked by the disease. Calculate the coefficient of association between vaccination and attack of the disease. Comment on the value of the coefficient of association. (05)
- (3) Write short note on stem and leaf diagram. (05)
- (4) If a and b are any two positive numbers then prove that Arithmetic Mean \geq Geometric Mean \geq Harmonic Mean. (05)
- (5) Discuss effect of change of origin and scale on standard deviation. (05)
- (6) The following data pertain to workers of two factories. (05)

| | Factory A | Factory B |
|---------------------------------|-----------|-----------|
| No. of workers | 100 | 200 |
| Mean time of completing the job | 40 | 42 |
| Standard deviation (minutes) | 8 | 6 |

- i. Obtain combined mean.
- ii. Workers of which company are more efficient?

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- (7) In a market survey of 25000 women from Mumbai, exactly one fourth were non-Maharashtrians. 15 out of every 25 women were employed and 70% of Maharashtrians were employed. 60% of employed Maharashtrian women and 20% of employed non-Maharashtrians were married. The number of married Maharashtrian women who were unemployed was 3250 and 1435 unmarried non-Maharashtrian were unemployed. (05)
- Tabulate the information and give a suitable title.
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