

Answer key
S3- B.com Internal test 1- Aug 2011
Basic Numerical Skills

Objective type

1. Indirect oral investigation
2. Education
3. Class mark
4. Multiple bar diagram
5. Frequency curve
6. Arithmetic mean
7. Median
8. median

Short answer type

9. Horace secrist: statistics are aggregates of facts affected to a marked extent by multiplicity of causes, numerically expressed, enumerated or estimated according to a reasonable degree of accuracy, collected in a systematic manner for a predetermined purpose and placed in relation to each other.
10. The characteristics of data that can be measured numerically is known as variable in statistics.
Eg: height, weight, mark, etc.
11. Secondary data are those which have been collected by some other person for his purpose and published. Eg: news papers, journals, research reports, etc

Short essay type

12. Uses of graphs and diagrams
 - a. They can present quantitative data in simple and clear manner
 - b. They can be used for comparison
 - c. They saves time for understanding data
 - d. They make whole data readily intelligibleLimitations of graphs and diagrams
 - a. They can show only limited amount of information
 - b. They shows only approximate values
 - c. They cannot indicate small difference in large measurement
 - d. They can be misused very easily
 - e. They are not capable of further mathematical treatment
13. Histogram hints
 - a. Classes should be converted into exclusive type
 - b. Scales on both X axis and Y axis should originate from zero
 - c. Frequency curve should be a smooth curve by joining mid points of each bars.
 - d. Both ends of the curve should be connected to the base line by joining to the mid points of the adjacent classes.
14. $a=5, n=30, \sum fd=40$ and $AM = a + \left(\frac{\sum fd}{N}\right) = 6.33$
15. $n_1=60, n_2=40, n_3=50$ and $X'=114, X_1'=107.75, X_3'=110$ and

$$\text{Combined mean } X' = \frac{n_1X_1' + n_2X_2' + n_3X_3'}{n_1 + n_2 + n_3} \text{ . so } X_2' = 128.3$$

Long essay type

16. A) Mode is the value of the item of a series which occurs most frequently. Therefore modal value has highest frequency.

Merits of mode

- it is a simple measure of central tendency
- it can be located at a glance
- it less affected by extreme values
- it can be located graphically
- usually mode coincides with one of the values in the series

Limitations of mode

- It is ill defined in some case
- It is not capable of further algebraic treatment
- Sometimes grouping becomes necessary to identify the modal value
- Mode is not based on all the values of the series

B) prepare grouping table.

Modal class: 39.5 – 49.5

$$L_1 = 39.5, f_1 = 30, f_0 = 18, f_2 = 16, c = 10 \text{ and } \text{mode} = L_1 + \frac{(f_1 - f_0) * c}{2f_1 - f_0 - f_2} = 44.12$$

17. A) median is the value of the item which occupies the central position when the items are arranged in the ascending or descending order of their magnitude.

Merits of median

- It is very simple measure
- It is not affected by extreme values
- It is suitable for even such data which are not capable of numerical expressions
- It can be determined graphically
- It is the suitable average in case of open end series

Demerits of median

- It is not based on all observations
- It is not capable of algebraic treatment
- It requires arraying
- In the case of continuous series the median value is only an approximate value

B) form exclusive type classes with frequencies from the given cumulative frequency table.

Median class = 50 – 60

$$L_1 = 50, N = 250, cf = 96, f = 31, c = 10 \text{ and } \text{median} = L_1 + \left(\frac{\frac{N}{2} - cf}{f} \right) * c = 59.35$$