

CHAROTAR ENGLISH MEDIUM SCHOOL, ANAND

Sub: Statistics

Std: 11 Commerce

Time: 2 hours

Date: 28.01.2019

Marks:50

SECTION –A MCQ [4]

1. (c) It is not necessary to check while using
2. (c) 5
3. (a) Census inquiry
4. (c) Constant function

SECTION –B Answer in one sentence [4]

5. What is a Variable?
The Value Which varies from unit to unit of population or sample is called variable.
6. Define symmetric frequency distribution?
Frequency distribution with lack of skewness is called symmetric frequency distribution.
7. Find the value of ${}_{20}C_3$?
 $20 \times 19 \times 18 / 6 = 1140$
8. What is sampling?
Process of selecting sample from population is called sampling.

SECTION –C: Answer the following [12]

9. List out four sources of secondary data.
-Government official websites, CSO, Magazine, Newspaper
10. What is Negative skewness?
If the left tail of frequency distribution curve is more elongated then it is called negative skewness.
11. How many total permutation are possible for the word 'MISSISSIPPI'.
 $\frac{11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{4 \times 3 \times 2 \times 1 \times 4 \times 3 \times 2 \times 1 \times 2 \times 1} = 34650$
12. Write the advantage of Simple random sampling?
 - (1) It is free from bias
 - (2) selected Sample are representative of of the population
 - (3) Reliable information can be obtained with less cost
13. Write a note on stratified random sampling.
When the population is heterogeneous with respect to variable characteristics then such population is divided into homogeneous strata and then simple random sample is selected from the each strata is call stratified random sample.
Sample selected through this method are most representative of the population. In this method the level of accuracy can be maintained.
14. For a real function, $f(x) = 9(x) - 5^{(x)} + 15$, find the value of $f(0)$.
 $F(0) = 9(0) - 5^{(0)} + 15 = 0 - 1 + 15 = 14$

SECTION –D Do as directed [12]

15. Write the usefulness of diagram.
 1. Diagram represent the data in attractive manner.
 2. The characteristics represented by diagram are remembered for long time.
 3. Diagram have visual presentation of data hence save the time.
 4. Pictorial diagram are easy to understand irrespective of language barrier.

5. Diagram can be easily understood by illiterate people.

16. Find the Standard deviation and coefficient of standard deviation.

Class	20-50	50-80	80-120	120-150	150-200
Frequency	15	18	12	25	15

Class	Frequency	xi	di=xi-a/10	fidi	fidi*di
20-50	15	35	-6.5	-97.5	633.75
50-80	18	65	-3.5	-63	220.5
80-120	12	100	0	0	0
120-150	25	135	3.5	87.5	306.25
150-200	15	175	7.5	112.5	843.75
Total				39.5	2004.25

$$\begin{aligned}
 S &= \sqrt{\frac{\sum fidi^2}{n} - \left(\frac{\sum fidi}{n}\right)^2} \\
 &= \sqrt{\frac{2004.25}{85} - \left(\frac{39.5}{85}\right)^2} \\
 &= 23.58 - 0.2116 \\
 &= 23.37 \\
 &= 4.83
 \end{aligned}$$

$$\bar{x} = A + \frac{\sum fidi}{n} \times C$$

$$\begin{aligned}
 &= 100 + \frac{39.5}{85} \times 10 \\
 &= 100 + (0.46 \times 10) \\
 &= 100 + 4.6 \\
 &= 104.6
 \end{aligned}$$

$$\begin{aligned}
 \text{Coefficient of standard deviation} &= \frac{s}{\bar{x}} = \\
 &= \frac{4.83}{104.6} = 0.046
 \end{aligned}$$

17. Find the Absolute measure of skewness by Karl Pearson's method from the following data.

Class	10-20	10-30	10-40	10-50	10-60	10-70
Frequency	8	12	24	36	45	50

Class	fi	xi	di	fidi	fidi * di	Cfi
10-20	8	15	-3	-24	72	8
20-30	4	25	-2	-8	16	12
30-40	12	35	-1	-12	12	24
40-50	12	45	0	0	0	36
50-60	9	55	1	9	9	45
60-70	5	65	2	10	20	50
	50			-25	129	

$$S_k = 3(x-m)$$

$$\begin{aligned}\bar{x} &= 45 + \frac{-25}{50} \times 10 \\ &= 45 - 5 \\ &= 40\end{aligned}$$

$$\begin{aligned}M &= 40 + \frac{25-24}{12} \times 10 \\ &= 40 + \frac{1}{12} \times 10\end{aligned}$$

$$M = 40.83$$

$$S_k = 3(40 - 40.83)$$

$$= -2.499999$$

$$= -2.5$$

18. In how many ways can six boys and five girls be arranged in a row such that all five girls sit together?

$$\text{Total permutation} = 7! \times 5! = 604800 \text{ ways}$$

SECTION-E : Do as directed [8]

19. There are six Apples, five Bananas and six oranges in a basket. In how many ways can three fruits be selected such that,

(1) all are Apples?

(2) all are different fruits?

(3) two are Apples and one is an orange?

(1) All are Apples = ${}^6C_3 = \frac{120}{6} = 20$ ways

(2) all are different fruits = ${}^6C_1 \times {}^5C_1 \times {}^6C_1 = 180$ ways

(3) two Apples and one orange = ${}^6C_2 \times {}^6C_1 = 90$ ways

20. Find the dictionary order of the word ATIRE.

Alphabetical order A E I R T

$$\text{TOTAL POSSIBLE WORDS} = 5! = 120$$

$$\text{WORDS BEGIN WITH EACH LETTER} = 120/5 = 24 \text{ WORDS}$$

$$\text{WORDS BEGIN WITH AE} _ _ _ = 6 \text{ WORDS}$$

$$\text{WORDS BEGIN WITH AI} _ _ _ = 6 \text{ WORDS}$$

$$\text{WORDS BEGIN WITH AR} _ _ _ = 6 \text{ WORDS}$$

Hence order of the word ATIREs

19) A T E I R

20) A T E R I

21) A T I E R

22) A T I R E

SECTION-F Do as directed [10]

21. From the following data calculate Middle most value and fiftieth percentile.

Class	20-40	40-60	60-80	80-100	100-120	120-140	140-160
Frequency	17	13	15	35	19	11	10

Class	Frequency	CFI
20-40	17	17
40-60	13	30
60-80	15	45
80-100	35	80
100-120	19	99
120-140	11	110
140-160	10	120

$$M = 80 + \frac{60-45}{35} \times 20 = 88.57$$

$$P50 = 80 + \frac{60-45}{35} \times 20 = 88.57$$

22. Find skewness and coefficient of skewness by Bowley's method.

Class	20-25	25-30	30-35	35-40	40-45	45-50
Frequency	15	20	25	30	35	40

class	fi	cfi
20-25	15	15
25-30	20	35
30-35	25	60
35-40	30	90
40-45	35	125
45-50	40	165
Total	165	

$$Q3 = L + \frac{\frac{3n}{4} - cfi}{fi} \times c$$

$$= 40 + \frac{123.75 - 90}{35} \times 5$$

$$= 44.82$$

$$Q1 = L + \frac{\frac{n}{4} - cfi}{fi} \times c$$

$$= 30 + \frac{41.25 - 35}{25} \times 5$$

$$= 31.25$$

$$M = L + \frac{\frac{n}{2} - cfi}{fi} \times c$$

$$= 35 + \frac{82.5 - 60}{30} \times 5$$

$$= 38.75$$

$$j = \frac{Q3 + Q1 - 2M}{Q3 - Q1}$$

$$= \frac{44.82 + 31.25 - 2(38.75)}{44.82 - 31.25}$$

$$= 76.07 - 77.5 / 13.57$$

$$= -1.43 / 13.57$$

$$= -0.11$$