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Section:- O
Serial: 07

Class	frequency (f)	cumulative frequency (cf)	Mid (x)	fx	f log x	f/x
1-2	1	1	1.5	1.5	0.17	0.667
2-3	3	4	2.5	7.5	1.19	1.20
3-4	8	12	3.5	28	4.35	2.28
4-5	6	18	4.5	27	3.91	1.33
5-6	2	20	5.5	11	1.48	0.36
Total:	n = 20			75	11.12	5.84

(a) Arithmetic Mean:-

$$AM = \frac{1}{n}\sum_{i=1}^{n} f_i x_i = \frac{75}{20} = 3.75$$

Geometric Mean:-

$$GM = \text{Antilog}\left(\frac{1}{n}\sum_{i=1}^{n} f_i \log x_i\right) = \text{Antilog}\left(\frac{11.12}{20}\right) = 3.60$$

Harmonic Mean:-

$$HM = \frac{n}{\sum_{i=1}^{n} \frac{f_i}{x_i}} = \frac{20}{5.84} = 3.42$$

(b) Median:- Here, $n/2 = 10$;

for class 3-4, $cf \geq 10$, so median class is (3-4)

We know that,

$$\text{Median} = L + \frac{\frac{n}{2} - c}{f} \times h$$

$$= 3 + \frac{\frac{20}{2} - 4}{8} \times 1$$

$$= 3.75$$

- lower limit of median class (L) = 3
- size of median class $h = 1$
- fre. of median class $f = 8$
- cf of previous class of median class (c) = 4

Name: Joy Matlebber

Serial: 07

Mode: The class 3-4 contains the highest frequency

So, the model class is (3-4)

We know that,

$$\text{Mode} = L + \frac{fm - f1}{2fm - f1 - f2} \times h$$

$$= 3 + \frac{8-3}{(2\times 8) - 3 - 6} \times 1$$

$$= 3.71$$

$fm = 8$
$f1 = 3$
$f2 = 6$
$L = 3$
$h = 1$

Class	f	x	fx	$\bar{x}$	$\lvert x-\bar{x}\rvert$	$f\lvert x-\bar{x}\rvert$	$f(x-\bar{x})^2$
1-2	1	1.5	1.5		2.25	2.25	5.06
2-3	3	2.5	7.5		1.25	3.75	4.68
3-4	8	3.5	28	75/20	0.25	2	0.5
4-5	6	4.5	27	= 3.75	0.75	4.5	3.37
5-6	2	5.5	11		1.75	3.5	6.12
Total:	n = 20		75			16	19.75

Mean deviation:

$$MD = \frac{1}{n}\sum_{i=1}^{n} f\lvert x-\bar{x}\rvert = \frac{16}{20} = 0.8$$

Variance: $\sigma^2 = \frac{1}{n}\sum_{i=1}^{n} f(x-\bar{x})^2 = \frac{19.75}{20}$

$= 0.98$

Name: Joy Matubber
Serial: 07

Standard deviation.

$$SD = \sigma = \sqrt{0.98} = 0.9899$$

Coefficient of Variation:

$$CV = \frac{\sigma}{\bar{x}} \times 100\% = \frac{0.989}{3.75} \times 100\%$$

$$= 26.39\%$$

Skewness = Mean - Median

$$= 3.75 - 3.75 = 0$$

So, the distribution is symmetrical.

probability

(3.1)

Tickets are numbered as 1 to 20.

A = Multiple of 3 = {3, 6, 9, 12, 15, 18}; So, $P(A) = \frac{6}{20}$

B = " " 5 = {5, 10, 15, 20}; So, $P(B) = \frac{4}{20}$

So, $A \cap B$ = {15}; So, $P(A \cap B) = \frac{1}{20}$

$$\therefore P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$= \frac{6}{20} + \frac{4}{20} - \frac{1}{20}$$

$$= 0.45$$

$$= 45\%$$

Name: Joy Matubber
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(3.2)

There are 15 boys and 10 girls in a class

so, Total number of student = 30.25

Now,

1 girl and 2 boyes total three students seleect at randomly.

The probability will be $= \frac{^{15}C_2 \times {}^{10}C_1}{^{25}C_3}$

$= 0.456$

$= 45.6\%$ Ans:

(3.3) A bag contains 4 white, 5 red, and 6 blue balls

Total balls ~~are~~ is 15.

If 3 drawn three balls at randomly

The probability that all of them are red will be $= \frac{^5C_3}{^{15}C_3}$

$= \frac{2}{91}$ Ans:

(3.4)

The mobile operators office there are 5 electronic engineers and 6 computer engineers

∴ total = 6 + 5 = 11

A Commitee of 4 is to be formed randomly to perform a duty. Then the probility will consist.

(a) All electronic engineers, $= \frac{5c_4}{11c_4}$

$= \frac{1}{66}$

$= 1.51\%$

(b) 2 electronic engineers and 2 computer engineers, the probility will be.

$$P(B) = \frac{5c_2 \times 6c_2}{11c_4}$$

$$= \frac{5}{11}$$

$$= 45.54\%$$