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Ans.No-15

Class Interval	Frequency, f	cf	Mid Point, x	fx	$x'$	flogx	f/x	$ x_i - x' $	$f x_i - x' $	$f(x_i - x')^2$
1-2	1	1	1.5	1.5	3.75	0.18	0.67	2.25	2.25	5.06
2-3	3	4	2.5	7.5		1.19	1.20	1.25	3.75	4.69
3-4	8	12	3.5	28		4.35	2.29	0.25	2	0.50
4-5	6	18	4.5	27		3.92	1.33	0.75	4.5	3.38
5-6	2	20	5.5	11		1.48	0.36	1.75	3.5	6.13
Total	20			75		11.12	5.85		16	19.75

From the table,

$$(a) \text{ Arithmetic mean} = \frac{75}{20} = 3.75$$

$$\text{Geometric mean} = \text{antilog} \left( \frac{5.85}{20} \right) \\ = 3.597.$$

$$\text{Harmonic mean} = \frac{20}{5.85} = 3.419.$$

$$(b) \text{ Total, } n = 20; \text{ Hence, } n/2 = \frac{20}{2} = 10$$

For the class (3-4), we get cf = 12 > 10

Hence, this is our median class.

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

$$= 3 + \frac{10 - 4}{8} \times 1 = 3.75$$

For the class (3-4), we have the highest frequency 8. Hence, this is our modal class.

$$\text{Mode, } Mo = L + \frac{f_m - f_1}{2f_m - f_1 - f_2} \times h$$

$$= 3 + \frac{8 - 3}{2 \times 8 - 3 - 6} \times 1 = 3.71$$

(c) Here, mean = 3.75

from b, median = 3.75

$$Sk = \text{mean} - \text{median}$$

$$= 3.75 - 3.75$$

$$= 0; \text{ that is symmetric.}$$

So, the distribution is symmetric.

(d) Mean deviation =  $\frac{16}{20} = 0.80$ .

(e) Variance,  $\sigma^2 = \frac{19.75}{20} = 0.99$

Standard deviation,  $\sigma = \sqrt{0.99} = 0.995$

(f) coefficient of variation =  $\frac{0.995}{3.75} \times 100\%$   
 $= 26.53\%$

$$\frac{\sigma}{\mu} \times 100 = \frac{0.995}{3.75} \times 100 = 26.53\%$$

### "Exercise-3"

3.1. Tickets are numbered as 1 to 20.

Let, A = multiple of 3

$$= \{3, 6, 9, 12, 15, 18\}$$

$$\text{So, } P(A) = \frac{6}{20} = \frac{3}{10}$$

Let, B = multiple of 5

$$= \{5, 10, 15, 20\}$$

$$\text{So, } P(B) = \frac{4}{20} = \frac{1}{5}$$

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

We know,  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

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

$$= \frac{3}{10} + \frac{1}{5} - \frac{1}{20}$$

$$= \frac{9}{20} = 0.45$$

[Ans]



3.2. There are 15 boys and 10 girls in a class.

$$\text{Total student} = (15 + 10) = 25.$$

Hence, 1 girl and 2 boys are selected at random.

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

$$= \frac{21}{46} = 0.457 \text{ [Ans].}$$

3.3 A bag contain 4 white, 5 red and 6 blue balls.

$$\text{Total ball} = (4 + 5 + 6) = 15$$

$$\text{The probability of red ball} = \frac{{}^5C_3}{{}^{15}C_3}$$

$$= \frac{2}{91} = 0.021$$

[Ans].

3.4. There are 5 electronic engineers and 6 computers engineers in a mobile operator's office.

$$\text{Total engineers} = (5 + 6) = 11$$

(a) Let, A = all electric engineers.

$$P(A) = \frac{{}^5C_4}{{}^{11}C_4} = \frac{1}{66} = 0.015$$

(b) Let, B = 2 electronic engineers and 2 computer engineers.

$$P(B) = \frac{{}^5C_2 \times {}^6C_2}{{}^{11}C_4}$$

$$= \frac{5}{11} = 0.45$$

[Ans].