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Subject: Statistics Test No. WEEK-5 Date: 18-11-24

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3	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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SHORT QUESTIONS

Q2 (i)

Set:-

"A set is a collection of well-defined distinct objects".

⇒ The objects which make up a particular set, are called elements or members of the set.

⇒ The sets are usually denoted by capital letters as A, B, C etc. and the elements of set are generally denoted by small letters.

* For example: Set of vowels is $V = \{a, e, i, o, u\}$

(ii)

Q2:- Solve $\frac{12!}{10!}$

Two methods:-

1 method:-

$$\begin{aligned} \frac{12!}{10!} &= \frac{12 \times 11 \times 10!}{10!} \\ &= 12 \times 11 \\ &= 132 \text{ Ans} \end{aligned}$$

2 method:-

$$\begin{aligned} \frac{12!}{10!} &= \frac{12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1} \\ &= \frac{12 \times 11 \times 10}{1} \\ &= 132 \text{ Ans} \end{aligned}$$

(iii)

Sample space = $S = \{H_1H, HT, TH, TT\} \rightarrow n(S) = 4$

let event 'A' be : A = at least one head

$$\therefore A = \{HH, HT, TH\} \rightarrow n(A) = 3$$

Now $P(A) = \frac{\text{number of favourable outcomes}}{\text{total number of possible outcomes}} = \frac{n(A)}{n(S)}$



$$P(A) = \frac{3}{4}$$

∴ (iv) :-

Sample Space = $S = \{1, 2, 3, 4, 5, 6\} \Rightarrow n(S) = 6$

let 'A' be an event such that A = even number appears

$$\therefore A = \{2, 4, 6\} \Rightarrow n(A) = 3$$

$$\text{Now, } P(A) = \frac{n(A)}{n(S)}$$

$$P(A) = \frac{3}{6} \Rightarrow \frac{1}{2} \text{ or } 0.5 \text{ Ans.}$$

LONG

QUESTION

∴ Q3 :-

Sample space when two dices are thrown: -

$$S = \{ (1,1), (1,2), (1,3), (1,4), (1,5), (1,6), \\ (2,1), (2,2), (2,3), (2,4), (2,5), (2,6), \\ (3,1), (3,2), (3,3), (3,4), (3,5), (3,6), \\ (4,1), (4,2), (4,3), (4,4), (4,5), (4,6), \\ (5,1), (5,2), (5,3), (5,4), (5,5), (5,6), \\ (6,1), (6,2), (6,3), (6,4), (6,5), (6,6) \}$$

* But according to the given condition, the elements which have both same numbers are excluded. Therefore, we will have new sample space.

$$S = \{ (1,2), (1,3), (1,4), (1,5), (1,6), \\ (2,1), (2,3), (2,4), (2,5), (2,6), \\ (3,1), (3,2), (3,4), (3,5), (3,6), \\ (4,1), (4,2), (4,3), (4,5), (4,6), \\ (5,1), (5,2), (5,3), (5,4), (5,6), \\ (6,1), (6,2), (6,3), (6,4), (6,5) \}$$

$$n(S) \Rightarrow 30$$

(i) Probability that sum is 6:

let event 'A' be : A = sum of numbers is 6

$$\therefore A = \{ (1,5), (2,4), (4,2), (5,1) \}$$

$$\Rightarrow n(A) = 4$$

Now, $P(A) = \frac{\text{numbers of favourable outcomes}}{\text{total number of possible outcomes}} = \frac{n(A)}{n(S)}$

$$P(A) = \frac{4}{30} \Rightarrow P(A) = \frac{2}{15}$$

(ii) Probability that the sum is 4 or less:-

let 'B' be an event such that A = sum of sum numbers is 4 or less

$$\therefore B = \{(1,2), (1,3), (2,1), (3,1)\} \Rightarrow n(B) = 4$$

$$\text{Now } P(B) = \frac{n(B)}{n(S)}$$

$$P(B) = \frac{4}{30} \Rightarrow P(B) = \frac{2}{15}$$

(iii) Probability that sum is even:-

let 'C' be an event such that C = sum of numbers is even

$$\therefore C = \{(1,3), (1,5), (2,4), (2,6), (3,1), (3,5), (4,2), (4,6), (5,1), (5,3), (6,2), (6,4)\} \\ \Rightarrow n(C) = 12$$

$$\text{Now, } P(C) = \frac{n(C)}{n(S)} = \frac{12}{30} = \frac{2}{5} \text{ Ans:-}$$