

IKRAM ASMAT

BCSE - 4C - 142

STATISTICS And Probability

Assignment No # 02

Ques.

Sol.

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

$$n(S) = 6$$

Now

let A is an even number

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

$$P(A) = \frac{n(A)}{n(S)} = \frac{3}{6} = \frac{1}{2}$$

Now

let B is a multiple of 2

$$B = \{2, 4, 6\}, n(B) = 3$$

$$P(B) = \frac{n(B)}{n(S)} = \frac{3}{6} = \frac{1}{2}$$

Now

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) \rightarrow ①$$

$$A \cap B = \{2, 4, 6\}, n(A \cap B) = 3$$

$$P(A \cap B) = \frac{n(A \cap B)}{n(S)} = \frac{3}{6} = \frac{1}{2}$$

Now

Eqn ① \Rightarrow

$$P(A \cup B) = \frac{1}{2} + \frac{1}{2} - \frac{1}{2}$$

$$P(A \cup B) = \frac{1+1-1}{2}$$

$$\boxed{P(A \cup B) = \frac{1}{2}} \quad \text{Ans}$$

Ques 2.

Sol. $S = \{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\}$

$$n(S) = 8$$

Now

let A be the probability of
three tails so

$$A = \{TTT\}$$

$$n(A) = 1$$

$$\boxed{P(A) = \frac{n(A)}{n(S)} = \frac{1}{8}}$$

NOW

let B be the event three tail
at least one tail

$$B = \{HHT, HTH, HTT, THH, THT, TTH, TTT\}$$

$$n(B) = 7$$

$$\boxed{P(B) = \frac{n(B)}{n(S)} = \frac{7}{8}}$$

NOW

$$P\left(\frac{A}{B}\right) = \frac{P(A \cap B)}{P(B)} \rightarrow \textcircled{1}$$

$$(A \cap B) = \{TTT\}$$

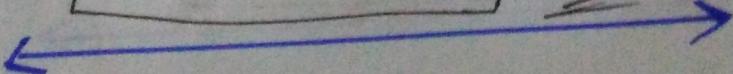
$$n(A \cap B) = 1$$

$$P(A \cap B) = \frac{1}{8}$$

so n $\textcircled{1} \Rightarrow$

$$P(A/B) = \frac{1/8}{7/8}$$

$$\boxed{P(A/B) = \frac{1}{7}} \quad \underline{\underline{\text{Ans}}}$$



Q No 3

Sol:

Green Balls = 6

Red Balls = 3

Total Balls = 9

$$n(S) = 9$$

Let A be the first ball drawn from the bag

$$n(A) = 6$$

$$P(A) = \frac{n(A)}{n(S)} = \frac{6}{9} = \frac{2}{3}$$

Let B be the second ball drawn before the first ball is returned

$$P(B) = \frac{n(B)}{n(S)} = \frac{5}{8}$$

Now $P(A \cap B) = P(A) \cdot P\left(\frac{B}{A}\right)$
 $= \frac{2}{3} \cdot \frac{5}{8}$

$$\boxed{\frac{5}{12}} \quad \text{Ans}$$

Q Noy

sol.

$$\text{Total Students} = n(S) = 90$$

$$\text{failed Students} = 55$$

$$2^{\text{nd}} \text{ grade} = 20$$

$$1^{\text{st}} \text{ grade} = 10$$

$$3^{\text{rd}} \text{ grade} = 5$$

$$P(A \text{ or } B) = P(A \cup B) = P(A) + P(B) \rightarrow \textcircled{1}$$

let A be the 1st grade
Students

$$n(A) = 10$$

$$P(A) = \frac{10}{90} = \frac{1}{9}$$

Let B be the failed student

$$n(B) = 55$$

$$P(B) = \frac{n(B)}{n(S)} = \frac{55}{90} = \frac{11}{18}$$

Use in Eqn ①

$$P(A \cup B) = \frac{11}{18} + \frac{1}{9} = \frac{11+2}{18}$$

$$\boxed{P(A \cup B) = \frac{13}{18}}$$

