ASSIGNMENT-2

Dr. Kiran & Dr. Monika

(1) Solution :-

P(A) = I^st Card is spade

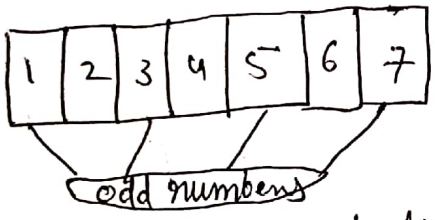
$$P(A) = \frac{13_{C_1}}{52_{C_1}} = \frac{13}{52}$$

P(B) = II^nd Card is spade (without replacing)

$$= \frac{12_{C_1}}{51_{C_1}} = \frac{12}{51} = \frac{4}{17}$$

Ans :- Probability of Second Card drawn is spade = 4/17

(2) Sol :-



A → (having three balls with odd numbers.)

~~P(A) = 8~~

A → I^st ball odd.

$$P(A) = \frac{4_{C_1}}{7_{C_1}}$$

$$P(B) = P\left(\frac{B}{A}\right) = \frac{3_{C_1}}{6_{C_1}} = 3/6$$

$$P(C) = \text{III}^{rd} \text{ odd ball} = \frac{2_{C_1}}{5_{C_1}} = \frac{2}{5}$$

$$P(\text{having three odd balls}) = P(A).P\left(\frac{B}{A}\right).P\left(\frac{C}{A \cap B}\right)$$

$$= \frac{4}{7} \times \frac{3}{6} \times \frac{2}{5} = \frac{4}{35}$$

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(3)

I st urn	II urn
2 (W)	1 (W)
1 (B)	5 (B)

Suppose Shifted ball is white.

P (Drawn ball white) $= \frac{2}{3} \times \frac{2}{7}$

$= \frac{4}{21}$

(4)

B_1	B_2
3 S.S.	5 C.S
3 C.S.	3 S.S

$P(A) = P$ (Selecting B_1 Box) $= \frac{2}{3}$

$P(B) = P(-\!\!-\!\!-\!\!-\ B_2) = 1/3$

Selection)

$= \frac{3}{8}$

$P(A) = P(A).P\left(\frac{B}{A}\right) + P(B)P\left(\frac{A}{B}\right)$

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

$= \frac{1}{3} + \frac{1}{8} = \frac{8+3}{24} = \frac{11}{24}$

Ans = 11/24

(5)

A	B
Diagnosed Correctly 60%	wrong diagonal

Death = D.

$P(A) = D.\text{Correctly} = \frac{60}{100}$

$P(B) = \omega.\text{Diagonal} = \frac{40}{100}$

$P(A \cap D) = P$ (Death by D.C)

$= P(A).P\left(\frac{D}{A}\right)$

$=$

$P(B \cap D) = P$ (Death by D. wrongly)

$= P(B \cap D)$

$= P(B).P\left(\frac{D}{B}\right)$

$P\left(\frac{A}{D}\right) = \frac{P(A).P\left(\frac{D}{A}\right)}{P(A).P\left(\frac{D}{A}\right) + P(B).P\left(\frac{D}{B}\right)}$

$= \frac{60}{100} \times \frac{40}{100}$

$\frac{60}{100} \times \frac{40}{100} + \frac{40}{100} \times \frac{70}{100}$

$= \frac{\frac{24}{100}}{\frac{24}{100} + \frac{28}{100}} = \frac{6/25}{52/100}$

$= \frac{6}{25} \times \frac{100}{52} = \frac{24}{52} = \frac{6}{13}$

Ans (5) → (B) → $\frac{6}{13}$

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$X=x$	-2	-1	0	1	2
$P(x)$	$1/9$	$2/9$	$3/9$	$2/9$	$1/9$

$$P(|X|>1) = P(|-2|>1) + P(1>1)$$
$$= P(2>1$$
$$1/9$$
$$= \frac{2}{9} \times P(x = 2/9$$

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(8) $\Sigma P(x) = 1$ $\qquad \Sigma P(x) = 1$

$11K^2+10K = 1$ $\qquad 11K^2+10K-1 = 0$

$K(11K+10) = 0$ $\qquad 11K^2+(11-1)K-1 = 0$

$K=0$ $\qquad 11K(K+1)-1(K+1) = 0$

$(K+1)(11K-1) = 0 \Rightarrow K = -1, 1/11$

$$P(X<3) = P(X=0)+P(X=1)+P(X=2)$$
$$= 0+2K+3K$$
$$= 5K = 5 \times 1/11$$
$$= \frac{5}{11} = 0.4545$$

Ans (c) $= 0.4545 \approx 0.455$

(9) $n \rightarrow$ Mutually independent events are given

$P_1, P_2 \ldots P_n$.

$P_1 \rightarrow$ is the prob. of happ. of event

$(1-P_1) \rightarrow$ is the prob. of non happ. of event

So $(1-P_1)(1-P_2)\ldots(1-P_n)$ is the prob. of non happening of events

So. $= \{1-\{(1-P_1)(1-P_2)\ldots(1-P_n)\}\}$ is the prob. of happening of at least of one event happens

Ans — (B)

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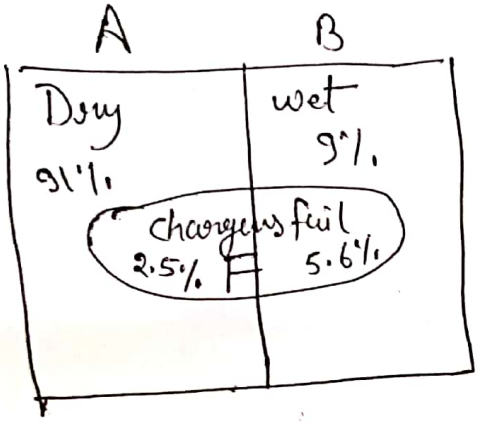
(6) (c) → (6) · 6561

$$(1-P_1)(1-P_2)(1-P_3)(1-P_4)$$
$$= (0.9)(0.9)(0.9)(0.9)$$

(7)



Total probability theorem.

$$P(\text{Fails}) = P(A).P\left(\frac{E}{A}\right) + P(B).P\left(\frac{E}{B}\right)$$
$$= \frac{2.5}{100} \times \frac{91}{100} + \frac{5.6}{100} \times \frac{9}{100}$$
$$= 0.025 \times 0.91 + 0.056 \times 0.09$$
$$= 0.0277$$
$$= 0.28$$

Ans 7(D)