Day-3

1) A speaks truth in 75% of cases and B in 80% of cases. In what percentage of cases are they likely to contradict each other, narrating the same incident

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| A) 30/100 | B) 35/100 |
| C) 45/100 | D) 50/100 |

**Answer:** B) 35/100  
  
**Explanation:** Let   A = Event that A speaks the truth

B = Event that B speaks the truth   
Then P(A) = 75/100 = 3/4

P(B) = 80/100 = 4/5

P(A-lie) = 1−3 / 4= 1/4

P(B-lie) = 1−4/ 5= 1/5

Now, A and B contradict each other =[A lies and B true] or [B true and B lies]

 = P(A).P(B-lie) + P(A-lie).P(B)

 = (3 / 5\*1/5)+(1 / 4\*4 / 5)=7 / 20

 = (7 / 20\*100)720\*100= 35%

2) A bag contains 50 tickets numbered 1,2,3,4......50 of which five are drawn at random and arranged in ascending order of magnitude.Find the probability that third drawn ticket is equal to 30.

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| A) 551/15134 | B) 1/2 |
| C) 552/15379 | D) 1/9 |

Total number of elementary events = 50C5  
Given,third ticket =30

=> first and second should come from tickets numbered 1 to 29 = 29C2 ways and remaining two in 20C2 ways.

Therfore,favourable number of events = 29C2\*20C2

Hence,required probability = 29C2\*20C2/50C5 =551 / 15134

3) A bag contains 4 red and 3 black balls. A second bag contains 2 red and 4 black balls. One bag is selected at random. From the selected bag, one ball is drawn. Find the probability that the ball drawn is red.

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| A) 23/42 | B) 19/42 |
| C) 7/32 | D) 16/39 |

**Explanation:**

A red ball can be drawn in two mutually exclusive ways

 (i) Selecting bag I and then drawing a red ball from it.

(ii) Selecting bag II and then drawing a red ball from it.

Let E1, E2 and A denote the events defined as follows:

E1 = selecting bag I,

E2 = selecting bag II

A = drawing a red ball

Since one of the two bags is selected randomly, therefore

P(E1) = 1/2  and  P(E2) = 1/2

Now, P(A / E1)= Probability of drawing a red ball when the first bag has been selected = 4/7

  P(A / E2)= Probability of drawing a red ball when the second bag has been selected = 2/6

 Using the law of total probability, we have

 P(red ball) = P(A) = P(E1)×P(A / E1)+P(E2)×P(A / E2)

                          = 1/ 2×4 /7+1 / 2×2 / 6=19 / 42

4) Two brother X and Y appeared for an exam. The probability of selection of X is 1/7 and that of B is 2/9. Find the probability that both of them are selected.

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| A) 1/63 | B) 1/14 |
| C) 2/63 | D) 1/9 |

**Explanation:**

Let A be the event that X is selected and B is the event that Y is selected.

P(A) = 1/7,  P(B) = 2/9.

Let C be the event that both are selected.

P(C) = P(A) × P(B) as A and B are independent events:

       = (1/7) × (2/9)  = 2/63

5) A box contains 10 bulbs,of which just three are defective. If a random sample of five bulbs is drawn, find the probability that the sample contains exactly one defective bulb.

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| A) 5/12 | B) 7/12 |
| C) 3/14 | D) 1/12 |

**Answer:** A) 5/12  
  
**Explanation:** Total number of elementary events = 10C5

Number of ways of selecting exactly one defective bulb out of 3 and 4 non-defective out of 7 is 3C1\*7C4

So,required probability =3C1\*7C4/10C5 = 5/12.

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