ASSIGNMENT-2

EE24BTECH11043 - Murra Rajesh Kumar Reddy

1) A is targeting B,B and C are targeting to A.Probability of hitting the target by A, B and C are $\frac{2}{3}, \frac{1}{2}$ and $\frac{1}{3}$ respectively. If A is hit then find the probability that B hits the target and C does not. $(2003 - 2Marks)$
2) A and B are two independent events. C is event in which exactly one of A or B occurs. Prove that $P(C) \geq P(A \cup B)\, P\left(\overline{A} \cap \overline{B}\right)$ $(2004 - 2Marks)$
3) A box contains 12 red and 6 white balls.Balls are drawn from the box one at a time without replacement. If in 6 draws there are at least 4 white balls, find the probability that exactly one white drawn in the next two draws. (binomial coefficients can be left as such) $(2004 - 4Marks)$
4) A person goes to office either by car, scooter,bus or train the probability of which being $\frac{1}{7}, \frac{3}{7}, \frac{3}{7}, \frac{2}{7}$, and$\frac{1}{7}$ respectively. Probability that he reachs office late, ife takes car,scooter,bus or train is $\frac{2}{9}, \frac{1}{9}, \frac{4}{9}$ and $\frac{1}{9}$ respectively. Goven that he reached office in time, then what is the probability that he travelled by a car. $(2005 - 2Marks)$

G Comprehension Based Questions

PASSAGE-1

There are n urns, each of these contain n+1 balls. The i^{th} urn contains $i$white balls and $(n + 1 - i)$ red balls. Let u_1 be the event of selecting i^{th} urn, $i = 1, 2, 3 \ldots, n$ and w the event of getting a white ball.

1) If $P(u_i) \propto i$, where $i = 1, 2, 3, \ldots, n$, then $\lim_{n\to\infty} P(w) =$ $(2006 - 5M, -2)$

a) 1 b) $\frac{2}{3}$ c) $\frac{3}{4}$ d) $\frac{1}{4}$

2) If $P(u_i) = c$, (a constant) then $P\left(\frac{u_n}{w}\right) =$ $(2006 - 5M, -2)$

a) $\frac{2}{n+1}$ b) $\frac{1}{n+1}$ c) $\frac{n}{n+1}$ d) $\frac{1}{2}$

3) Let $P(u_i) = gn$, if n is even and E denotes the event of choosing even numbered urn, then the value of $P\left(\frac{w}{E}\right)$ is $(2006 - 5M, -2)$

a) $\frac{n+2}{2n+1}$ b) $\frac{n+2}{2(n+1)}$ c) $\frac{n}{n+1}$ d) $\frac{1}{n+1}$

PASSAGE-2

A fair die is tossed repeatedly until a six is obtained. Let X denote the number of tosses required. (2009)

4) The probability that $X = 3$ equals

a) $\frac{25}{216}$ b) $\frac{25}{36}$ c) $\frac{5}{36}$ d) $\frac{125}{216}$

5) The probability that $X \geq 3$ equals

a) $\frac{125}{216}$ b) $\frac{25}{216}$ c) $\frac{5}{36}$ d) $\frac{25}{36}$

6) The conditional probability that $X \geq 6$ given $X > 3$ equals

a) $\frac{125}{216}$ b) $\frac{25}{216}$ c) $\frac{5}{36}$ d) $\frac{25}{36}$

PASSAGE-3

Let U_1 and U_2 be two urns such that U_1 contains 3 white and 2 red balls, and U_2 contains only 1 white ball.A fair coin is tossed.If head appears then 1 ball is drawn at random from U_1 and put into U_2.However, if tail appears then 2 balls are drawn at random from U_1 and put into U_2. Now 1 ball is drawn at random from U_2. (2011)

7) The probability of the drawn ball from U_2 being white is

a) $\frac{13}{30}$ b) $\frac{23}{30}$ c) $\frac{19}{30}$ d) $\frac{11}{30}$

8) Given that the drawn ball from U_2 is white, the probability that head appeared on the coin is

a) $\frac{17}{23}$ b) $\frac{11}{23}$ c) $\frac{15}{23}$ d) $\frac{12}{23}$