AMA1104 assignment 1 Answer all questions (Deadline: week 11 , 11th of November, 2021)

1. For two events A and B, $P(A)=\frac{3}{5}$, $P(B)=\frac{1}{6}$ and $P(A\cup B)=\frac{7}{10}$.

(a) Find $P(A\cap B)$.

(b) Find $P(A\,|\,B)$. (4marks)

2. For two events A and B, $P(A)=\frac{2}{7}$, $P(B)=\frac{1}{2}$ and $P(A\,|\,B)=\frac{1}{5}$.

(a) Find $P(B\,|\,A)$.

(b) Find $P(B\,|\,A')$.

(c) Find $P(B'\,|\,A')$. (5marks)

3. There are 6 yellow balls and 9 green balls in a bag. If 3 balls are chosen one by one randomly from the bag without replacement, find the probabilities of the following events.

(a) The first ball chosen is yellow and the last two balls chosen are green.

(b) Only the first two balls chosen are of the same colour.

(4 marks)

4. Four cards are drawn randomly from a pack of 52 playing cards (without jokers). Find the probabilities of the following events.

(a) Exactly two black cards are drawn.

(b) At least three kings are drawn.

(c) Exactly two black cards are drawn, given that at least three kings are drawn.

(Given your answers correct to 4 decimal places.)

(6 marks)

5. Two dice are thrown. Let A be the event that an odd number is obtained on the first dice, B be the event that the number obtained is greater than 5 on the first dice, C be the event that the number obtained on the second dice is smaller than 5, and D be the event that the sum of the two numbers obtained is 8. State whether each of the following is a pair of independent events or dependent events.

(a) A and B

(b) A and C

(c) B and D

(d) C and D (4marks)

6. In a survey, 45% of the interviewees are of age below 30, 30% are between 30 and 50, and 25% are above 50. 90% of the interviewees aged below 30, 60% of the interviewees aged between 30 and 50, and 70% of the interviewees aged above 50 can swim.

(a) If a randomly selected interviewee can swim, find the probability that his/her age is between 30 and 50.

(b) If a randomly selected interviewee cannot swim, find the probability that his/her age is below 30.

(Give your answers correct to 3 significant figures if necessary.) (7marks)