Tutorial Sheet - 8

CCBCA104)

Problem 1: Determine the sample space for the indicated experiments.

(a) A coin is tossed three times.

(b) A die is thrown two times.

(c) A coin is tossed and a die is thrown.

Problem 2: Suppose 3 bulbs are selected at random from a lot. Each bulb is tested and classified as defective (D) or non-defective (N). Write the sample space of this experiment.

Problem 3: A experiment involves rolling a pair of dice and recording the number that comes up. Describe the following events:

A: the sum is greater than 8

B: 2 occurs on either die

C: the sum is atleast 7 and a multiple of 3.

Which pairs of these events are mutually exclusive?

Problem 4: A card is selected from a pack of 52 cards.

(a) How many elements are there in the sample space?

(b) Calculate the probability that the card is an ace of spades.

(c) Calculate the probability that the card is (i) an ace (ii) black card

Problem 5: Three coins are tossed once. Find the probability of getting

(a) 3 heads (b) 2 heads (c) atleast 2 heads (d) almost 2 heads (e) no head (f) exactly two tails

Problem 6: A letter is chosen at random from the word "ASSASSINATION".

Find the probability the letter is
(a) a vowel (b) a consonant

Problem 7: Check whether the following probabilities $P(A)$ and $P(B)$ are well defined.

(a) $P(A) = 0.5$, $P(B) = 0.7$, $P(A \cap B) = 0.6$

(b) $P(A) = 0.5$, $P(B) = 0.4$, $P(A \cup B) = 0.8$

Problem 8: In an entrance test that is graded based of two examinations, the probability of a randomly chosen student passing the first examination is 0.8 and the probability of passing the second examination is 0.7. Find the probability of passing atleast one of them is 0.95. What is the probability of passing both.

Problem 9: Given that E and F are events such that $P(E) = 0.6$, $P(F) = 0.3$ and $P(E \cap F) = 0.2$. Find $P(E/F)$ and $P(F/E)$.

Problem 10: Evaluate $P(A \cup B)$, if $P(A) = P(B) = \frac{5}{13}$ and $P(A/B) = \frac{2}{5}$.

Problem 11: Assume that each born child is equally likely to be a boy or a girl. If a family has two children, what is the conditional probability that both are girls given

(i) the youngest is a girl

(ii) atleast one is a girl?