MA2110 PROBABILITY

1) Let A and B denote sets containing 3 and 5 elements respectively. Let F denote a function from A to B. The probability of F being one-to-one is?

2) The probability of getting a "tail" in a single toss of a biased coin is 0.2. If the coin is tossed repeatedly until a "head" is obtained, given that the tosses are independent, find the probability of getting "head" for the first time in 7th toss.

3) Set A = {2, 7, 10, 15}
Set B = {5, 9, 6, 1}
Two numbers are chosen at random, one from each set. What is the probability that their sum is 16.

4) A fair die is rolled twice. If the first roll shows a "3", what is the probability that total sum from the two rolls will be 8.

5) A bowl contains 8 red balls, 4 green balls and 8 yellow balls. All of these balls are identical except for their color. A ball is drawn at random from the bowl and it is not a red ball. Find the probability of it being a green ball.

6) A batsman for a cricket team has a good game with probability 0.6 and a bad game with 0.4. When he has a good game, he scores at least 50 runs with a probability of 0.5; and when he has a bad game, he scores at least 50 runs with a probability of 0.2. Given that he scored 62 runs in a particular game, what is the probability that he had a good game?

7) Two events X and Y are such that

$P[X \cap Y] = 0.15$

$P[X \cup Y] = 0.65$

$P[X|Y] = 0.5$

Find $P[Y|X]$.

8) A professor went to the post office to mail a package. The professor gave the postal attendant a currency note he believed was ~~20~~ ₹20. The postal attendant gave ~~him~~ her change based on the belief that he received ₹10 from the Professor. Both the parties are honest but humans make mistakes. The professor started to dispute the change.
If the attendant's drawer contains 30 ₹20 notes and 20 ₹10 notes and he correctly identifies notes 90% of the time, what is the probability that the professor's claim is valid?

9) ~~Given~~ The probability that a given positive integer lying between 1 and 100 (both inclusive) is not divisible by 2, 3 or 5 is?

10) The probability that a "k" digit hexadecimal number does not contain the digits 0, 3 or 7 is?