Extra Questions

1.	(i) Suppose a string of n bits is sent across a lossy link. In how many ways can 2 bit errors occur? When $n=3$, list the possible set of bit error patterns.	[5 marks]

	(ii) In how many ways can the letters MISSISSIPPI be rearranged?	[10 marks]

	(iii) In poker a straight flush consists of 5 cards in order, all of the same suit e.g. the 2,3,4,5,6 of clubs. How many straight flushes are possible?	[10 marks]

2.	(i) Six people get into an elevator at the ground floor of a hotel which has 10 upper floors. Assuming each person gets off at a floor uniformly at random, what is the probability that no two people get off at the same floor?	[10 marks]

3.	(i) A random variable X has P(X=x)=x/15 for x=1, 2, 3, 4, 5, and P(X=x) is 0 for all other values. What is the mean and variance of X?	[5 marks]

	(ii) You perform the following experiment: you take a six-sided die, and roll it. If the number that comes up is six, you stop; otherwise you repeat.

	a) What is the distribution of the number of times you roll the die?	[5 marks]

	b) What is the expected number of rolls?	[10 marks]