COURSE: ADVANCED MATHEMATICAL STRUCTURES FOR COMPUTING
CODE: SCS 2203

Test 1

1. Describe the following events and write down the formula for calculating their probabilities:

         i) Independent events.   [3]

         ii) Mutually exclusive events.   [3]

         iii) Conditional probability.   [3]

2. In the same experiment, the events A = {1, 3} and B = {2, 3, 4, 5} are not mutually exclusive. Justify [1]

3. What is the probability that the total of two dice will be greater than 9, given that the first die is a 5? [5]

4. A Computer Science lecturer gave his class two tests. 25% of the class passed both tests and 42% of the class passed the first test. What percent of those who passed the second test also passed the first test? [3]

5. Derive Bayes' Theorem. [5]

6. A bag contains six tags marked 1, 2, 3, 4, 5 and 6, from which a farmer picks to tag his goats for identification in his farm. What is the probability that a farmer picks tags with an odd number or a number larger than 4? [4]

7. A chocolate recipe is produced by two factories 1 and 2. Factory 1 produces 40% of the recipe, but 5% of its recipe is bad. Factory 2 produces 60% of the recipe, but 10% of its recipe is also bad. Compute the probability that a bad recipe is not from factory 1. [8]

8. What is the probability that the total of two dice will be greater than 9, given that the first die is a 5? [5]

9. The average number of International aeroplanes landing at the Joshua Mqabuko Nkomo airport is 2 aeroplanes per week. Calculate the probability that exactly 3 aeroplanes will land the following week. [5]

10. A NUST graduate applied to Econet for employment. The probability that the graduate will be called for interview is 0.5. If 5 graduates form NUST apply, what is the probability that at most 2 will be called for an interview. [4]

END