**NANYANG TECHNOLOGICAL UNIVERSITY**
**School of Electrical & Electronic Engineering**

**EE4491 Probability Theory & Applications**

**Tutorial No. 3 (Sem 1, AY2021-2022)**

1. A pair of dice are tossed 8 times.
   (a) Find the probability that a 7 will occur exactly 4 times.
   (b) Find the probability that an 11 will occur 2 times.
   (c) Find the probability that a 12 will occur more than once.

2. A file containing 8000 characters is to be transferred from one computer to another. The probability of any one character being transferred in error is 0.001.
   (a) Find the probability that the file can be transferred without any error.
   (b) Find the probability that there will be exactly 10 errors in the transferred file.
   (c) What must the probability of error in transferring one character be in order to achieve the probability of transferring the entire file without error as large as 0.99?

3. When a pair of dice are rolled, let *A* be the event of obtaining a number of 6 or greater and let *B* be the event of obtaining a number of 6 or less. Are events *A* and *B* dependent of independent?

4. If *A* is independent of *B*, prove that
   (a) $A$ is independent of $\bar{B}$.
   (b) $\bar{A}$ is independent of $\bar{B}$.

Answer

(1) (a) 0.02605; (b) 0.0613; (c) 0.0193
(2) (a) $p_0 = 3.335 \times 10^{-4}$; (b) $p_{10} = 0.09926$; (c) $p = 1.256 \times 10^{-6}$
(3) dependent