CS-105 (Probability and Statistics)
S.C.& S.S., J.N.U
Mid-semester Exam II - 08/4/2019 - Paper B

Time: 1 hour **Total Marks: 20**

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1. If X is any discrete random variable and a, b are any two real numbers, then show that $E(aX+b) = aE(X)+b$
(4 Marks)

2. Describe the probability space, range and the probability mass function of the random variable given by the number of aces obtained by a given person P_1 when a pack of 52 cards is distributed equally among a group of 4 people P_1, P_2, P_3 and P_4.
(6 marks)

3. Compute the variance of the Uniform distribution with parameter a and b.
(4 marks)

4. The lifetime X (in years) of a car has the following probability density function

$$f(x) = \begin{cases} 2e^{-2x} & x > 0 \\ 0 & \text{otherwise} \end{cases}$$

(a) Compute the expected value and variance of X.

(b) What is the probability that the car survives more than 4 years?

(6 Marks)