HOME WORK B: ELEMENTARY PROBABILITY, TERM 121 DUE ON SATURDAY, 15 SEPT, 2012

B.1 Customers who purchase a certain make of a car can order engine in one of the two sizes. Of all cars sold, 45% have the smallest engine, 55% have the medium or largest. Of cars with the smallest engine, 10% fail an emission test within two years of purchase, while those with the medium or largest size engine 13% fail an emission test.

a. What is the probability that a car is small sized and fail an emission test?

b. What is the probability that a car fail an emission test?

c. A record of cars that failed emission test is chosen at random. What is the probability that it is for a car with smallest engine?

B.2 Customers who purchase a certain make of a car can order engine in one of the two sizes. Of all cars sold, 45% have the smallest engine, 35% have the medium sized engine and 20% have the largest. Of cars with the smallest engine, 10% fail an emission test within two years of purchase, while those with the medium size 12% fail an emission test and those with largest size engine 15% fail an emission test.

a. What is the probability that a car is small sized and fail an emission test?

b. What is the probability that a car fail an emission test?

c. A record of cars that failed emission test is chosen at random. What is the probability that it is for a car with smallest engine?

B.3 An urn contains 10 identical balls numbered 0,1, 2, …, 9. A random experiment involves selecting a ball from the urn and noting the number of the ball. Find the probability of the following events:

a. $A = \{\text{number of ball selected is odd}\}$.

b. $B = \{\text{number of ball selected is a multiple of 3}\}$.

c. $C = \{\text{number of ball selected is less than 5}\}$.

d. $A \cup B$.

e. $A \cup B \cup C$.