## Lab 2

### Unit 3: Introduction to Probability:

1. The following table shows the survey result regarding the purchase behavior of TV's and DVD players in the last six months of 300 household.

| Purchase TV | Purchase DVD | |
|---|---|---|
| | Yes | No |
| Yes | 38 | 42 |
| No | 70 | 150 |

   a. Find the probability that a randomly selected household that purchased a TV. b. Find the probability that a randomly selected household that purchased a TV and a DVD player

   c. What is the probability that a randomly selected household that purchased a TV or a DVD player?

   d. What is the probability that a randomly selected household that purchased a DVD player given that household purchased a TV?

2. A factory produces a certain type of output by three types of machines. The respective daily production figures are Machine I: 3000 units, Machine II: 2500 units and Machine III: 4500 units. Past experience shows that 3% of the output produced by machine I is defective. The corresponding fraction of defectives for the other two machines is 1.2% and 2% respectively. An item is drawn at random from the production and is found to be defective. What is the probability that it comes from the output of

   i. Machine I ii. Machine II iii. Machine III

3. A bag cartoon contains 6 Dell Laptops, 9 Lenovo Laptops and 5 Acer Laptops. Two laptops are selected at random, find the probability that

   i. Both Laptops are Lenovo ii. Dell and Acer Laptop

4. In a certain assembly plant, three machines $E_1$, $E_2$ and $E_3$ make 30% , 45% and 25% respect ively of the product. It is known from past experience that 2%, 3% and 2% of the products made by each machine $E_1$, $E_2$ and $E_3$ respectively are defective. If a product was chosen randomly and found to be defective, what is the probability that it was made by

   i. Machine $E_1$

   ii. Machine $E_2$ or $E_3$

5. Probability that a student passes in Numerical method is 0.75 and in Computer graphics is 0.85. Find the probability that student passes in
   i. Both subjects ii. At least one subject iii. None of subjects.
6. Three roads A, B and C lead away from a jail. A prisoner escaping from the jail selects a road at random. If a road A selected, the probability of escaping is $^{1}_{10}$. Similarly for road B it is $^{1}_{8}$and for road C it is $^{1}_{5}$
   a. What is the probability that prisoner will succeed in escaping?
   b. If the prisoner had succeeded in escaping, what is the probability that he had chosen the road A?