

**Spring 2024-  
2025  
ECON 205**

**Problem Set I**

**Q1)** A chef can make starters, main courses, and desserts. Four different starters, seven different main course, and three different desserts are under consideration.

i) If she wants to make a menu with a single starter, main course, and dessert, how many experimental menus are possible?

ii) How many experimental menus consists of only tomato soup as a starter?

**Q2)**

**a)** Two cards are drawn from a standard 52-card playing deck. What is the probability that the draw will yield an ace and a face card?

**b)** Five cards are dealt from a standard 52-card deck. What is the probability that we draw 3 aces and 2 kings?

**c)** Five cards are dealt from a standard 52-card deck. What is the probability that we draw 1 ace, 1 two, 1 three, 1 four, and 1 five?

**Q3)** Cards are dealt, one at a time, from a standard 52-card deck. If the first 2 cards are both spades, what is the probability that the next three cards are also spades?

**Q4)** Same product is produced by machines A, B and C. %5 of the products produced by Machine A, %4 of the product produced by Machine B and %3 of the products produced by Machine C is broken. In a single day %25 of the products are produced by Machine A, %30 of the products are produced by Machine B and %45 of the products are produced by Machine C. A product produced in a single day is randomly selected and known to be broken then what is the probability that that product is produced by Machine C.

**Q5)** One needs to distribute 20 labors to four different construction jobs. The first job required 6 labors, the second, third and fourth utilized 4, 5 and 5 labors, respectively. Find the probability of the observed events assuming that the labors are randomly assigned to jobs.

**a)** All 4 members of a particular ethnic group are placed on job 1.

**b)** An ethnic group member is assigned to each type of job.

**Q6)** A local fraternity is conducting a rafle where 50 tickets are to be sold- one per customer. There are three prizes to be rewarded. If the four organizers of the rafle each buy one ticket, what is the probability that the four organizers win

- a. All the prizes?
- b. Exactly two of the prizes?
- c. Exactly one of the prizes?
- d. None of the prizes?

**Q7)** A monkey is to demonstrate that she recognize colors by tossing one red, one black and one white ball into boxes of the same respective colors, one ball to a box. If the monkey has not learned the colors and merely tosses one ball into each box at random, find the probability of the following results:

- a. There are no colors matches.
- b. There is exactly one color match.