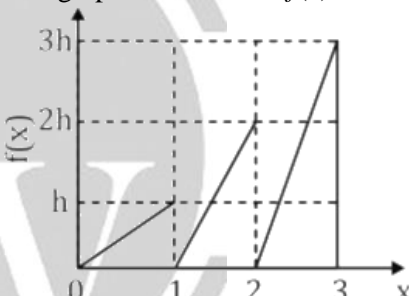## Subject: Engineering Mathematics
Chapter: Probability
Topic : Introduction to Random Variable

DPP-04

1. The probability that a k-digit code does NOT contain the digits 0,5 or 9 is
   (a) 0.3^k (c) 0.7^k
   (b) 0.6^k (d) 0.9^k

2. In a pathology class, the professor decided to conduct a test of swine flu on all the students. Test result says that one student in every ten is having swine flu. What is the probability that out of 5 students expected to attend the class, at least 4 will not have swine flu?

3. A fair dice is tossed eight times. The probability that in first three throws three sixes is observed in a total of eighth throws is

4. A fair dice is tossed eight times. The probability that exactly three sixes is observed in a total of eighth throws is

5. A fair dice is tossed eight times. The probability that a third six is observed on the eighth throw is

6. P(4th head in 10th throw when coin is tossed 10 times)

7. The random variable X takes on the values 1, 2 or 3 with probabilities 2 + 5P/5,1 + 3P/5, 1.5 + 2P/5 respectively. The values of P and E(X) are respectively
   (a) 0.05, 1.87   (c) 0.05, 1.10
   (b) 1.90, 5.87   (d) 0.25, 1.40

8. Let X be a random variable with probability density function

$$f(x)\begin{cases} 0.2 & \text{for} |X| \leq 1 \\ 0.1, & \text{for } 1 < |X| \leq 4 \\ 0, & \text{otherwise} \end{cases}$$

   The probability P $(0.5 < X < 5)$ is _____.

9. The graph of a function $f(x)$ is shown in the figure

   For $f(x)$ to be a valid probability density function the value of h is
   (a) 1/3   (c) 1
   (b) 2/3   (d) 3

10. A manufacturing company supplies condensers with 1% defective pieces. Condensers are packed in boxes of 100. Find the probability that a box picked at random will have four or more faulty condensers.

Answer Key

1. (c)
2. (0. 98415)
3. (0.00186)
4. (0.0002)
5. (0.00015)

6. (0.082)
7. (a)
8. (0.4)
9. (a)
10. (0.019)