Question 1

I. Suppose a fair die is thrown twice, then

1) the probability that the sum of numbers of the two dice is less than or equal to 4 is;

(A) 0.1667 (B) 0.6667 (C) 0.8333 (D) 0.1389

2) the probability that at least one of the die shows 4 is;

(A) 0.6667 (B) 0.3056 (C) 0.8333 (D) 0.1389

3) the probability that one die shows one and the sum of the two dice is four is;

(A) 0.0556 (B) 0.6667 (C) 0.3056 (D) 0.1389

4) the event A={the sum of two dice is 4} and the event B={exactly one die shows two} are,

(A) Independent (B) Dependent (C) Disjoint (D) None of these.

II. 5) Assume that $P(A) = 0.3$, $P(B) = 0.4$, $P(A \cap B \cap C) = 0.03$, and $P(\overline{A \cap B}) = 0.88$, then the event A and B are,

(A) Independent (B) Dependent (C) Disjoint (D) None of these.

6) Using question (5), $P(C|A \cap B)$ is equal to,

(A) 0.65 (B) 0.25 (C) 0. 35 (D) 0.14

7) If the probability that it will rain tomorrow is 0.23, then the probability that it will not rain tomorrow is:

(A) -0.23 (B) 0.77 (C) -0.77 (D) 0.23

Question 2

I. The probability that a factory will open a branch in Riyadh is 0.7, probability that it will open a branch in Jeddah is 0.4, and the probability that it will open a branch in either Riyadh or Jeddah or both is 0.8, then the probability that it will open a branch:

8) In both cities is:

(A) 0.1 (B) 0.9 (C) 0.3 (D) 0.8

9) In neither cities is:

(A) 0.4 (B) 0.7 (C) 0.3 (D) 0.2

II. The probability that a lab specimen contains high levels of contamination is 0.10. Three samples are checked , and the samples are independent, then:

10) the probability that none contains high levels of contamination is:

(A) 0.0475 (B) 0.001 (C) 0.729 (D) 0. 3

11) the probability that exactly one contains high levels of contamination is:

(A) 0.243 (B) 0.081 (C) 0.757 (D) 0. 3

Question 3

I. If in a class of 324-Stat. of 80 students, 60 are from engineering college and the rest are from computer science college, 10% of the engineering college students have taken this course before, and 5% of computer science college students have taken this course before. If one student from this class is randomly selected, then:

12) the probability that he has taken this course before is:

(A) 0.25 (B) 0.0875 (C) 0.8021 (D) 0. 75

13) If the selected student has taken this course before then the probability that he is from the computer science college is:

(A) 0.1429 (B) 0.375 (C) 0.80 (D) 0. 25

II. A random sample of 200 adults are classified according to sex and their level of education in the following table:

Education	***Male***	***Female***
Elementary	28	50
Secondary	38	45
College	22	17

If a person is selected at random from this group, then:

14) the probability that he is a male is:

(A) 0.3182 (B) 0.44 (C) 0.28 (D) 78

15) The probability that the person is male given that the person has a secondary education is:

(A) 0.4318 (B) 0.4578 (C) 0.19 (D) 0.44

16) The probability that the person does not have a college degree given that the person is a female is:

(A) 0.8482 (B) 0.1518 (C) 0.475 (D) 0.085

III.

17) A man wants to paint his house in 3 colors. He can choose out of 6 colors. How many different color settings can he make?

(A) 216 (B) 20 (C) 18 (D) 120

18) If continuous random variable X has a mean $\mu=16$, a variance $\sigma^2=5$, then $P(X=16)$ is,

(A) 0.0625 (B) 0.5 (C) 0.0 (D)None of these.

19) A lower bound valued according to Chebyshev's theory for $P(\mu-2\sigma<X<\mu+2\sigma)$ is,

(A) 0.3175 (B) 0.750 (C) 0.965 (D) 0.250

20) A random variable X has a mean $\mu=12$, a variance $\sigma^2=9$, and unknown probability distribution. Using Chebyshev's theorem, $P(3<X<21)$ is at least equal to,

(A) 8/9 (B) 3/4 (C) 1/4 (D) 1/16

Question 4

I. A shipment of 7 television sets contains 2 defective sets. A hotel makes a random purchase of 3 of the sets.

21) If x is the number of defective sets purchased by the hotel, the probability of no defective television set, $P(X=0)$ is,

(A) 0.57 (B) 0.14 (C) 0.29 (D) 0

22) $P(0<X\le 2)$ is,

(A) 0.29 (B) 0.43 (C) 0.71 (D) 1

II. Consider the density function

$$f(x)=\begin{cases}k\sqrt{x}, & 0<x<1\\ 0, & \text{elsewhere.}\end{cases}$$

23) The value of k is:

(A) 1 (B) 0.5 (C) 1.5 (D) 0.667

24) The probability $P(0.3 < X \leq 0.6)$ is,

(A) 0.4647 (B) <u>0.3004</u> (C) 0.1643 (D) 0.4500

25) The expected value of X, $E(X)$ is,

(A) <u>0.6</u> (B) 1.5 (C) 1 (D) 0.667

Question 5

Let X be a random variable with the following probability distribution:

x	-3	6	9
f(x)	0.167	0.5	0.333

26) $E(X)$ is,

(A) 4.0 (B) <u>5.5</u> (C) 6.5 (D) 6.0

27) $E(X^2)$ is,

(A) 30.25 (B) 36.0 (C) <u>46.5</u> (D) 126.0

28) Var (X) = σ_X^2 is,

(A) 13.25 (B) <u>16.25</u> (C) 90.25 (D) 95.75

29) $E[(2X+1)]$ is,

(A) 8 (B) 11 (C) <u>12</u> (D) 13

30) Variance of (2X+1)= σ_{2X+1}^2 is,

(A) <u>65</u> (B) 66 (C) 16.25 (D) 95.75