

Probability and Probability Distributions: Questions Only

1. Choose an incorrect statement from the ones given below:

- a. If an event is certain to occur, its probability is 1.
- b. Two events are said to be mutually exclusive if both events cannot occur at the same time.
- c. For any event A, $0 \geq P(A) \geq 1$
- d. The collection of all possible outcomes of a probability experiment is called a sample space.

2. When a single die is rolled, the probability of getting an even number is_____.

- a. 0
- b. $1/2$
- c. $1/6$
- d. $5/6$

3. If $P(A) = 0.5$, $P(B) = 0.4$, and A and B are mutually exclusive events, then $P(A \text{ and } B) =$ _____ and $P(A \text{ or } B) =$ _____.

- a. 0.9
- b. the information given is not enough
- c. 0.4
- d. 0.2
- f. 0
- e. 1
- g. 0.5
- h. 0.1

4. There are 25 students in a class. Many of the students were not well. The school nurse examined each student and constructed the following table 1:

Table 1

	Sore throat	No Sore Throat
Runny Nose	6	12
No Runny Nose	4	3

The probability that a randomly selected student has a running nose or sore throat is

- a. $\frac{7}{25}$
- b. $\frac{22}{25}$
- c. $\frac{18}{25}$
- d. $\frac{6}{25}$

5. Let A and B be events with $P(A) = 0.8$, $P(B) = 0.6$. Assume that A and B are independent events. Choose the correct answer for $P(A \text{ and } B)$.

- a. 1.4
- b. 0.75
- c. 0.2
- d. 0.48

6. Which of the following pair of events is independent?

- a. Tossing a coin and spinning a spinner
- b. Drawing a colored ball from a bag, and then drawing a second ball without replacing the first ball
- c. Fatima getting grade A in four subjects and Fatima getting a higher GPA
- d. Getting flu vaccination and falling sick due to flu

7. Let A and B be events with $P(A \text{ and } B) = 0.3$, $P(B) = 0.8$, $P(A) = 0.4$ and Find the conditional probability $P(A|B)$.

- a. 0.375
- b. 0.75
- c. 0.5
- d. 0.7

8. A random variable that may take on any value in an interval is known as a

- a. either a continuous or a discrete random variable, depending on the unit of measurement
- b. continuous random variable
- c. discrete random variable
- d. either a continuous or a discrete random variable, depending on the number

9. Which one of the following is not a requirement for a binomial experiment

- a. outcomes of each trial must be independent
- b. probability of success must change for each trial.
- c. each trial can have only two outcomes or outcomes that can be reduced to two outcomes. These outcomes can be considered as either success
- d. there must be a fixed number of trials

10. A computer monitor is composed of a very large number of points of light called pixels. It is not uncommon for a few of these pixels to be

defective. Let X represent the number of defective pixels on a randomly chosen monitor. The probability distribution of X is as follows

Table 2

x	0	1	2	3
$P(x)$	0.2	0.5	0.2	0.1

Then the expected number of defective pixels is _____ and the variance is _____.

- a. 0.96
- b. 0.663
- c. 1.4
- d. 0.98
- e. 0.76
- f. 1.2
- g. 0.872
- h. 0.44

11. Fill in the following blanks with correct answers:

The distribution given in table 3 _____ a probability distribution because _____.

Table 3

x	-2500	3000	4000	4500
P(x)	0.3	0.4	0.1	0.2

- a. the mean of the distribution is 1750
- b. one of the values of x is negative
- c. the sum of all the probabilities is equal to 1 and all the probabilities are between 0 to 1 (both inclusive)
- d. does not represent
- e. represents
- f. the values of x are too big

If 16 trials are conducted for a Binomial Distribution where $p = 25\%$, then $P(X=5)$ is given by

- a. $P(X = 5) = {}^{16}C_5 (0.25)^{16}$
- b. $P(X = 5) = {}^{16}C_5 (0.75)^{16}$
- c. $P(X = 5) = {}^{16}C_5 (0.25)^5$
- d. $P(X = 5) = {}^{16}C_5 (0.75)^{11} (0.25)^{16}$

12. What is the probability of getting 3 heads if a fair coin is flipped 10 times?

a. 0.1250

b. 0.1172

c. 0.0001

d. 0.0105

13. Choose the correct answer from the options given below:

1. If the mean of a binomial distribution is 10 and the probability of success is 0.25, then its variance will be **7.5**.

2. If the mean of a binomial distribution is 5 and the probability of success is 0.25, then its standard deviation will be **1.94**.

3. If mean and variance of a binomial distribution are 25 and 20, respectively. Then, the probability of failure is **0.8**.

- a. 7.5
- b. 1.94
- c. 1.23
- d. 0.8
- e. 0.25
- f. 3.75
- g. 0.75
- h. 0
- i. 2.74
- j. 0.2

14. If a die is rolled 600 times. Find:

1. Mean of showing 5 on the die **100.**
2. Variance (to 1 d.p.) of showing 5 on the die **83.3**
3. The standard deviation (to 1 d.p.) of showing 5 on the die **9.1.**

a. 10.6

b. 50

c. 100

d. 67

e. 45.1

f. 25

g. 11.1

h. 9.1

i. 83.3

j. 7.6