Statistics MCQ Question Bank

Second Paper

Abdullah Al Mahmud
www.statmania.info

1 Introduction to Probability

1. **The minimum value of probability is**

   (a) $-\alpha$ (b) 1 (c) 0 (d) -1

2. **Each element of sample space is called–**

   (a) Trial (b) Experiment (c) Variable (d) Sample Point

3. **Two events not ocurring together are called–**

   (a) dependent Events (b) Independent Events

   (c) Mutually Exclusive Events (d) Marginal Events

4. **If A and B are independent, which formula is correct?**

   (a) $P(A \cap B) = P(A) \cdot P(B)$ (b) $P(A \cap B) = P(\bar{A}) \cdot P(B)$

   (c) $P(A \cap B) = P(A) \cdot P(\bar{B})$ (d) $P(A \cap \bar{B}) = P(A) \cdot P(B)$

   Answer the next three questions based on the following information.

   A card is drawn from of pack of playing cards.

5. **What is the probability that the card is a King?**

   (a) 0.0192 (b) 0.25 (c) 0.5 (d) 0.0769

6. **P(The card is not from Diamonds)–**

   (a) $\frac{1}{2}$ (b) 0 (c) $\frac{3}{4}$ (d) $\frac{1}{4}$

7. **P(The card is red or Clubs)**

   (a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{3}{4}$

8. **If a neutral die is thrown, the probability of having a digit greater than 6 is**

   (a) $\frac{1}{6}$ (b) $\frac{0}{6}$ (c) $\frac{2}{3}$ (d) $\frac{3}{6}$

9. **Tossing a coin twice generates how many outcomes?**

   (a) 4 (b) 16 (c) 8 (d) 2

10. **The probability of two disjoint sets happening together is:**

    (a) 0.5 (b) 0 (c) 1 (d) $0 \leq x < 1$

    Answer the next three question using the following information

    $P(A) = \frac{1}{3}, P(B) = \frac{1}{2} \& P(A \cup B) = \frac{7}{12}$

11. $P(A \cap B) =?$

    (a) $\frac{5}{12}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) $\frac{15}{16}$

12. $P(A \cap \bar{B}) =?$

    (a) $\frac{1}{4}$ (b) $\frac{3}{4}$ (c) $\frac{5}{6}$ (d) $\frac{1}{12}$

13. **What is the probability that B occurs or A does not occur?**

    (a) $\frac{3}{4}$ (b) $\frac{7}{12}$ (c) $\frac{5}{12}$ (d) $\frac{11}{12}$

14. **An un contains 10 red and 5 black balls. Two balls are drawn; what is the probability of getting two red balls?**

    (a) $\frac{3}{7}$ (b) $\frac{4}{7}$ (c) $\frac{20}{21}$ (d) $\frac{2}{21}$

2 Random Variables

15. **How many types of random variables are there?**
    (a) 2 (b) 3 (c) 4 (d) 5

16. **Which of the following is not a discrete random variable?**
    (a) umber of students (b) Weight
    (c) Number of heads in coin toss (d) Population

17. **Which one is a property of a probability distribution?**
    (a) $P(x_i) = 0$ (b) $P(x_i \neq 1)$ (c) $\Sigma P(x_i) = 1$ (d) $\int_x P(X)dx \leq 1$

18. $f(x) = 2x; 0 < X < 3$**; What is F(3)?**
    (a) 3 (b) 0 (c) 1 (d) 0

    Answer the next two questions based on the following information:

    $P(x, y) = \frac{1}{21}(x + y); x = 1, 2, 3$ and $y = 1, 2$

19. **P(x)=?**
    (a) $P(x) = \frac{2x+3}{21}$ (b) $P(x) = \frac{x+3}{27}$ (c) $P(x) = \frac{4x+3}{21}$ (d) $P(x) = \frac{2x+5}{21}$

20. **P(y)=?**
    (a) $\frac{y+2}{7}$ (b) $\frac{y+3}{7}$ (c) $\frac{3y+2}{7}$ (d) $\frac{y+2}{9}$

21. **Which one is not a discrete random variable?**
    (a) Number of studnets (b) Weight
    (c) Number of heads in five coin tosses (d) Released version number of a software

22. **Which one is a property of joint probability distribution?**
    (a) $P(X_i, Y_j) < 1$ (b) $P(X_i, Y_j) = 0$ (c) $P(X_i, Y_j) < 0$ (d) $0 \leq P(X_i, Y_j) \leq 1$

23. **If** $f(x) = kx^3; -1 \leq x \leq 1$**, then k is**

    i) positive
    ii) negative
    iii) lies from -1 to 1

    (a) i (b) ii (c) iii (d) i and ii

    Answer the next two questions based on the following information.

x	4	5	6	3	2	1
P(X)	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

24. **The value of** $P(3 < X < 5)$ **is:**
    (a) $\frac{1}{2}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) 0

25. $P(x \neq 2) is$:
    (a) $\frac{5}{6}$ (b) 0
    (c) 1 (d) Can't be found from this information

3 Mathematical Expectation

26. **Expectation measures –**
    (a) Dispersion (b) Skewness (c) Kurtosis (d) Central tendency

27. **If $E(X) = -0.5$, then $E(1-2X) =$?**
    (a) 0 (b) -1 (c) 2 (d) 1

28. **If $P(X) = \frac{1}{10}; x = 1, 2, \cdots 10$, then $E(X) =$?**
    (a) 10 (b) 5.5 (c) 0 (d) 11

29. **Which formula of variance is correct?**
    (a) $V(X+Y) = V(X) + V(Y) - 2Cov(X,Y)$ (b) $V(X+Y) = V(X) + V(Y) + 2Cov(X,Y)$
    (c) $V(X+Y) = V(X) + V(Y) - 2Cov(X,Y)$ (d) $V(X+Y) = V(X) - V(Y) + 2Cov(X,Y)$

30. **X is a constant; what is the value of $V(\frac{x}{2})$?**
    i) 0
    ii) $\frac{1}{2}$
    iii) $\frac{1}{4}$
    (a) ii (b) i (c) iii (d) i and iii

4 Binomial Distribution

Answer the next two questions based on the following information.
X is a binomial variate with expectation 4 and standard deviation $\sqrt{3}$.

31. **What are the values of the parameters (mean and probability)?**
    (a) $16, \frac{1}{4}$ (b) $16, \frac{3}{4}$ (c) $15, \frac{1}{4}$ (d) $10, \frac{1}{4}$

32. **What is $P(X \neq 0)$?**
    (a) 0 (b) 0.01 (c) 0.99 (d) 1

5 Poisson Distribution

33. **X is a Poisson variate. P(2) = P(4). What is the value of the parameter?**
    (a) 12 (b) 3.46 (c) 3.6 (d) 4

34. **Mean of a Poisson variate is a. What is its standard deviation?**
    (a) 0 (b) a (c) $a^{\frac{1}{2}}$ (d) a^2

6 Vital Statistics

35. **Crude Birth Rate (CBR) is:**
    (a) $\frac{B}{P} \times 100$ (b) $\frac{B}{P} \times 1000$ (c) $\frac{P}{B} \times 100$ (d) $\frac{F}{P} \times 100$

36. **Which one is a measure of reproduction?**

i) CBR
ii) CDR
iii) NRR

(a) i (b) ii (c) iii (d) i and ii

Answer Key:

1. (c) 0
2. (d) Sample Point
3. (c) Mutually Exclusive Events
4. (a) $P(A \cap B) = P(A) \cdot P(B)$
5. (d) 0.0769
6. (c) $\frac{3}{4}$
7. (d) $\frac{3}{4}$
8. (b) $\frac{0}{6}$
9. (a) 4
10. (b) 0
11. (c) $\frac{1}{4}$
12. (a) $\frac{1}{4}$
13. (d) $\frac{11}{12}$
14. (a) $\frac{3}{7}$
15. (a) 2
16. (b) Weight
17. (c) $\Sigma P(x_i) = 1$
18. (c) 1
19. (a) $P(x) = \frac{2x+3}{21}$
20. (c) $\frac{3y+2}{7}$
21. (d) Released version number of a software
22. (d) $0 \leq P(X_i, Y_j) \leq 1$
23. (a) i
24. (b) $\frac{1}{6}$
25. (a) $\frac{5}{6}$
26. (d) Central tendency
27. (c) 2
28. (b) 5.5
29. (b) $V(X+Y) = V(X) + V(Y) + 2Cov(X,$
30. (b) i
31. (a) 16, $\frac{1}{4}$
32. (c) 0.99
33. (b) 3.46
34. (c) $a^{\frac{1}{2}}$
35. (b) $\frac{B}{P} \times 1000$
36. (c) iii