Time: 25 minutes   **Subject Code: 130**   **Full Marks: 25**

Answer all the questions. Each question is worth one (1) mark.

1. **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) $\frac{3}{6}$

2. **Tossing a coin twice generates how many outcomes?**
   (a) 4   (b) 16   (c) 8   (d) 2

3. **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
   $P(A) = \frac{1}{3}, P(B) = \frac{1}{2} \& P(A \cup B) = \frac{1}{4}$

4. $P(A \cap B) = ?$
   (a) $\frac{5}{12}$ (b) $\frac{1}{2}$ (c) $\frac{7}{12}$ (d) $\frac{15}{16}$

5. $P(A \cap \bar{B}) = ?$
   (a) $\frac{3}{4}$ (b) $\frac{5}{6}$ (c) $\frac{1}{4}$ (d) $\frac{1}{12}$

6. **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) $\frac{1}{3}$

7. **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) $\frac{2}{21}$

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

9. **If $f(x) = 2x; 0 < x < 3, F(3) = ?$**
   (a) 3   (b) 0   (c) 1   (d) 2.5

10. **Which one is a discrete random variable?**
    (a) Height   (b) Weight
    (c) Diameter   (d) Released version number of a software

11. **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) $0 \leq P(X_i, Y_j) \leq 1$

    Answer the next three questions based on the following information.
    A card is drawn from a pack of playing cards.

12. **What is the probability that the card is a King?**
    (a) 0.0192   (b) 0.25   (c) 0.5   (d) 0.0769

13. **P(The card is not from Diamonds)–**
    (a) $\frac{1}{2}$ (b) 0   (c) $\frac{3}{4}$ (d) $\frac{1}{4}$

14. **P(The card is red or Clubs)**
    (a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{3}{4}$

15. **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

16. **The minimum value of probability is**
    (a) $-\alpha$ (b) 1   (c) 0   (d) -1

17. **Each element of sample space is called–**
    (a) Trial   (b) Experiment   (c) Variable   (d) Sample Point

18. **Two events not ocurring together are called–**
    (a) dependent Events   (b) Independent Events
    (c) Mutually Exclusive Events   (d) Marginal Events

19. **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 two questions based on the following information.

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

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

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

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

23. **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) $\int_x P(X)dx \leq 1$

    Answer the next two questions based on the following information:
    $P(x,y) = \frac{1}{21}(x + y); x = 1, 2, 3$ and $y = 1, 2$

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

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

Answer Key: (Correction required)

1. (b) $\frac{0}{6}$

2. (a) 4

3. (b) 0

4. (c) $\frac{7}{12}$

5. (d) $\frac{1}{12}$

6. (a) $\frac{3}{4}$

7. (a) $\frac{3}{7}$

8. (a) 2

9. (c) 1

10. (d) Released version number of software

11. (d) $0 \le P(X_i, Y_j) \le 1$

12. (d) 0.0769

13. (c) $\frac{3}{4}$

14. (d) $\frac{3}{4}$

15. (a) i

16. (c) 0

17. (d) Sample Point

18. (c) Mutually Exclusive Events

19. (a) $P(A \cap B) = P(A) \cdot P(B)$

20. (b) $\frac{1}{6}$

21. (a) $\frac{5}{6}$

22. (b) Weight

23. (c) $\Sigma P(x_i) = 1$

24. (a) $P(x) = \frac{2x+3}{21}$

25. (c) $\frac{3y+2}{7}$