Multiple Choice Questions
(1 mark each)

1. A number x is chosen at random from the numbers -3, -2, -1, 0, 1, 2, 3, the probability that $|x| < 2$ is
   (a) $\dfrac{5}{7}$ (b) $\dfrac{2}{7}$ (c) $\dfrac{3}{7}$ (d) $\dfrac{1}{7}$

2. A bag contains 8 red, 2 black and 5 white balls. One ball is drawn at random. The probability that the ball drawn is not white is
   (a) $\dfrac{1}{2}$ (b) $\dfrac{2}{3}$ (c) $\dfrac{1}{4}$ (d) $\dfrac{2}{5}$

3. A letter is chosen at random from the word 'MATHEMATICS'. What is the probability that it will be a vowel?
   (a) $\dfrac{1}{2}$ (b) $\dfrac{3}{8}$ (c) $\dfrac{3}{11}$ (d) $\dfrac{4}{11}$

4. A number is selected from the numbers 1, 2, 3, 4, ..., 25. What is the probability that the number selected is a multiple of 5?
   (a) $\dfrac{1}{25}$ (b) $\dfrac{1}{5}$ (c) $\dfrac{4}{5}$ (d) $\dfrac{4}{25}$

Short Answer Type (I) Questions
(2 marks each)

5. It is given that in a group of 3 students, the probability of 2 students not having the same birthday is 0.992. What is the probability that the 2 students have the same birthday?

6. Answer the following statements.
   (i) Write the probability of a sure event.
   (ii) Write the probability of an event which is impossible.
   (iii) For an event E, write a relation representing the range of values of $P(E)$.

7. Two dice are rolled once. Find the probability of getting such numbers on the two dice, whose product is 12.

8. A box contains various number of cards 1, 2, 3, 4, 5, 6, 7, 8, 9 mixed throughly. One person draws a card from the box. Find the probability that the number on the card is
   (i) an even number
   (ii) divisible by 5

9. A game consists of tossing a 10 rupee coin 3 times and noting its outcomes each time. Sarita wins if all the tosses give the same result, i.e. three head or three tails and loses otherwise. Find the probability that Sarita will not win the game.

10. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, determine the number of blue balls in the bag.

11. 12 defective pens are accidentally mixed with 132 good ones. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out at random from this lot. Determine the probability that the pen taken out is a good one.

12. A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be
    (i) red?   (ii) white?   (iii) not green?
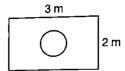
Short Answer Type (II) Questions   (3 marks each)

13. Two dice are thrown simultaneously. What is the probability that the sum of the numbers appearing on the dice is
    (i) 7?   (ii) a prime number?   (iii) 1?

14. A number x is selected from the numbers 1, 2, 3 and then a second number y is randomly selected from the numbers 1, 4, 9, then find the probability that the product xy of two numbers will be less than 9.

15. Suppose you drop a dice random on the rectangular region shown in figure. What is the probability that it will land inside the circle with diameter 1 m?

16. A class has 15 girls and 10 boys. The teacher calls on a student at random to answer a question. Express in decimal form, the probability that a student called upon is
    (i) a girl (ii) a boy (iii) a pupil in the class (iv) the teacher of the class.

Long Answer Type Questions   (5 marks each)

17. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting
    (i) a king of red colour.   (ii) a face card.
    (iii) a red face card.   (iv) a jack of heart.

18. Cards numbered 1, 2, 3, 4, 5,...., 17 are put in a box and mixed thoroughly. One person draws a card from the box. Find the probability that the number on the card is
    (i) an odd number.   (ii) a prime number.   (iii) divisible by 3.
    (iv) divisible by 2 and 3 both. (v) a multiple of 3 or 5.

Answers

1. (c)   2. (b)   3. (d)   4. (b)   5. 0.008

6. (i) 1 (ii) 0 (iii) $0 \le P(E) \le 1$ 7. $\frac{1}{9}$ 8. $-\frac{1}{2}$ and $\frac{1}{5}$ 9. $\frac{3}{4}$

10. 10   11. $\frac{11}{12}$ 12. (i) $\frac{5}{17}$ (ii) $\frac{8}{17}$ (iii) $\frac{13}{17}$

13. (i) $\frac{1}{6}$ (ii) $\frac{5}{12}$ (iii) zero.   14. $\frac{5}{9}$ 15. $\frac{\pi}{24}$ 16. (i) 0.6 (ii) 0.5 (iii) 1 (iv) 0

13. A copper wire 4 mm in diameter is evenly wound about a cylinder whose length is 24 cm and diameter 20 cm, so as to cover the whole surface. Find the length and weight of the wire assuming the specific density to be 8.88 gm/cm^3.

14. A metal cube of 9 cm edge is melted and recast into three smaller cubes. If the edge of two of the smaller cubes are 1 cm and 6 cm. Find the edge of the third cube.

Long Answer Type Questions   (5 marks each)

15. A solid toy is in the form of a hemisphere surmounted by a right circular cone. Height of the cone is 3 cm and the diameter of the base is 5 cm. If a right circular cylinder circumscribes the solid, then find how much more space it will require.

16. A building is in the form of a cylinder surmounted by a hemispherical vaulted dome which contains 17.7 m^3 of air and its internal diameter is equal to the height of the crown of the vault above the floor. Find the height of the building. [take, $\pi = 22/7$]

Answers

1. (a)	2. (a)	3. (b)	4. (a)	
5. 277 cm^3	6. 5.3 cm^3	7. 84	8. 231 cm^2	
9. 0.83 cm	10. 640 cm^2	11. 66.5 : 1	12. 572 cm^2	13. 4.21 kg
14. 8 cm	15. 17.705 π cm^3	16. 3 m (approx)		