

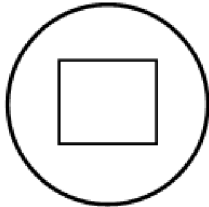


SECTION A

Followings multiple choice questions are of **1 Mark** each (Q01-10).

Select the correct option in each one of them.

- Q01. There is a square lawn of side 8 m inside a circular park of radius 20 m. Miss Jemimah wants to plant a sapling in the park.



The probability that she can plant it outside the lawn is

- (A) $\frac{32}{400\pi}$ (B) $\frac{64}{400\pi}$
 (C) $\frac{400\pi - 32}{400\pi}$ (D) $\frac{400\pi - 64}{400\pi}$

- Q02. Two dice is rolled once. The probability that the product of numbers obtained is even is

- (A) $\frac{1}{4}$ (B) $\frac{2}{4}$ (C) $\frac{3}{4}$ (D) $\frac{5}{6}$

- Q03. A box contains 5 red, 3 green and 2 blue balls. A ball is drawn at random. The probability that it is not green is

- (A) $\frac{3}{10}$ (B) $\frac{5}{10}$ (C) $\frac{7}{10}$ (D) $\frac{8}{10}$

- Q04. A letter is chosen at random from the word PROBABILITY. What is the probability that the chosen letter is a vowel?

- (A) $\frac{4}{11}$ (B) $\frac{5}{11}$ (C) $\frac{6}{11}$ (D) $\frac{7}{11}$

- Q05. A number is chosen from 1 to 90. Then the probability that it is a multiple of 2 or 3, is

- (A) $\frac{45}{90}$ (B) $\frac{60}{90}$ (C) $\frac{30}{90}$ (D) $\frac{50}{90}$

- Q06. If a number is selected at random from the first 100 natural numbers, what is the probability that it is divisible by neither 2 nor 5?

- (A) $\frac{30}{100}$ (B) $\frac{40}{100}$ (C) $\frac{50}{100}$ (D) $\frac{60}{100}$

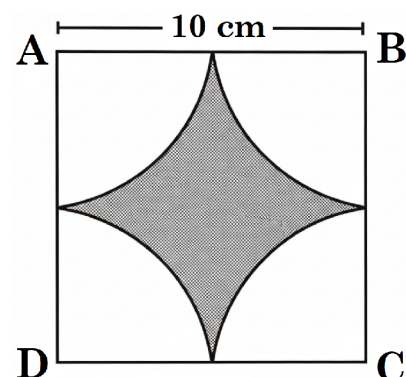
- Q07. A card is drawn at random from a well-shuffled deck of 52 cards. The probability that it is neither a red card nor a face card is

- (A) $\frac{19}{52}$ (B) $\frac{20}{52}$ (C) $\frac{23}{52}$ (D) $\frac{26}{52}$

- Q08. A square target of side 10 cm has arcs drawn from each vertex with radius 5 cm, forming a shaded region at the center.

The probability that a dart lands in this shaded region, is

- (A) $\frac{\pi}{4}$ (B) $\frac{4 + \pi}{4}$
 (C) $\frac{4 - \pi}{4}$ (D) $\frac{4 - \pi}{\pi}$



Followings are **Assertion-Reason based questions** (Q09 & 10).

In the following questions, a statement of Assertion (**A**) is followed by a statement of Reason (**R**).

Choose the correct answer out of the following choices.

- (A) Both **A** and **R** are true and **R** is the correct explanation of **A**.
- (B) Both **A** and **R** are true and **R** is not the correct explanation of **A**.
- (C) **A** is true but **R** is false.
- (D) **A** is false but **R** is true.

Q09. **Assertion (A)** : During an experiment, a pair of dice is thrown once. Then the probability that both have the same number such that the sum of numbers is at least 10, is $\frac{2}{18}$.

Reason (R) : If a number x is chosen at random from the collection of numbers $-3, -2, -1, 0, 1, 2, 3, 4$, then $\frac{3}{8}$ is the probability such that $|x| < 2$.

Q10. **Assertion (A)** : A selection committee interviewed some people for the post of Sales Manager. The committee wanted that the female candidates should also be given the fair chance. So they called male and female candidates in 3:4 ratio. Then the probability of a female candidate being selected is $\frac{4}{7}$.

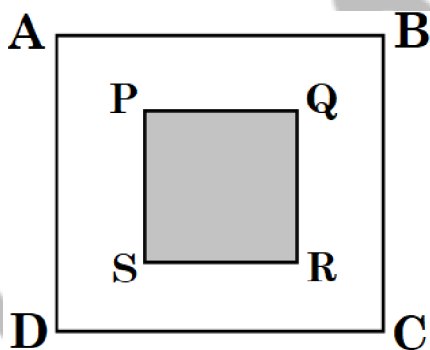
Reason (R) : (Probability of an event E) + (Probability of an event 'not E ') ≤ 1 .

[1×10 = 10]

SECTION B

Followings are of **2 Marks** each (Q11-12).

Q11. A game designer creates a dartboard with two concentric squares: the larger one has its side 1.5 times that of the smaller.



Find the probability of a dart landing inside the smaller square. Also find the probability of a dart landing outside the smaller square.

Q12. (a) A bag carries 5 red and 7 white balls. A ball is drawn at random from the bag. What is the probability that it is a

- (i) white ball?
- (ii) black ball?

OR

(b) A die has two faces each with number '1', three faces each with number '2' and one face with number '3'. If the die is rolled once, then determine

- (i) $P(2)$
- (ii) $P(\text{not } 3)$.

[2×2 = 4]

SECTION C

Followings are of **3 Marks** each (Q13-16).

Q13. Find the probability of getting 53 Fridays in a leap year.

Q14. (a) From a pack of 52 playing cards, two black kings and two black jacks are removed. From the remaining cards, a card is drawn at random. Find the probability that drawn card is neither an ace nor a king.

OR

(b) Two dice are thrown simultaneously. What is the probability that the sum of the two numbers appearing on the top is less than or equal to 10?

Q15. Two unbiased coins are tossed simultaneously. Find the probability of getting

- (i) two tails
- (ii) at least one head
- (iii) at most one head.

Q16. A die in the shape of tetrahedron has four faces on which 3, 4, 6 and 8 are written. The die is rolled once. Find the probability of getting a

- (i) prime number
- (ii) number less than 6
- (iii) a number between 4 and 8.

$$[3 \times 4 = 12]$$

SECTION D

Followings are of **5 Marks** each (Q17-18).

Q17. (a) Ekta and Sumer plan to visit a store, which remains open from Tuesday to Saturday. Both select their day of visit independently and at random. Write all the possible cases. Compute the probability that both visit the store on the same day.

OR

(b) A school conducts an online quiz competition every Sunday. There are 8 teams participating in the quiz - 3 senior teams, 3 junior teams and 2 mixed teams. For the final round, 1 team is selected randomly.



What is the probability that the selected team is a junior team?

After the quiz, the school decides that next week they will add 1 more junior team and 1 more mixed team. Now if one team is selected randomly next week, what will be the probability that the selected team is a junior team?

Q18. A family has children such that the number of girls exceeds the number of boys by 2. When one child is chosen at random to perform a task, the likelihood of selecting a girl is $\frac{2}{3}$, find the number of girls and boys in the family. If the family adopts one more child, what will be the new probability of selecting a girl or a boy?

$$[5 \times 2 = 10]$$

SECTION E

Following is a case-study based question of **4 Marks** (Q19); having three sub-parts (i), (ii) and (iii).

Q19. **CASE STUDY BASED QUESTION** : Nandini and Ruchi have to start the game of Ludo. They are deciding who will start. They found three coins and decided to toss them simultaneously to decide who will start the game.



Based on the above information, answer the following questions.

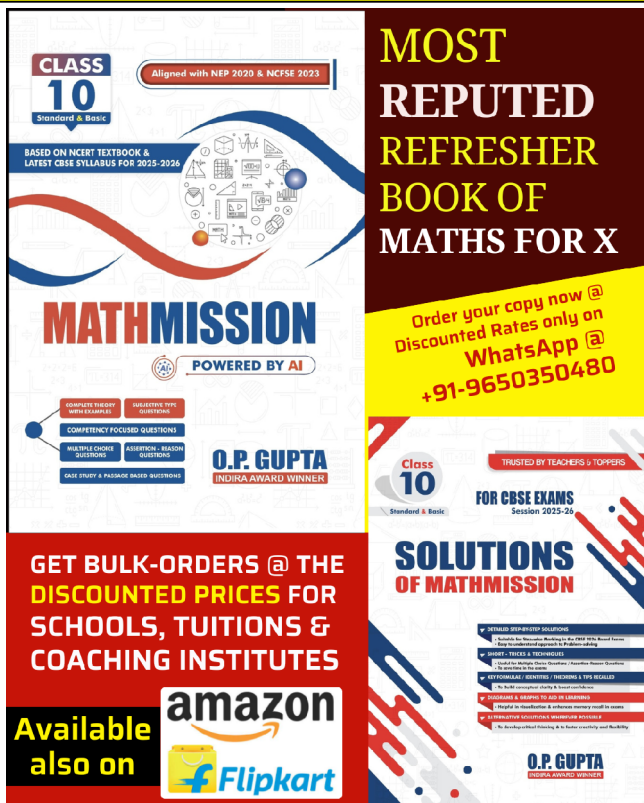
- (i) Write the possible number of outcomes.
- (ii) Find the probability of getting 3 tails on tossing three coins simultaneously.
- (iii) Nandini says, “if I get at least one head, I will start the game”.
Find the probability that Nandini will start the game.

OR

- (iii) Ruchi says, “if I get at most one tail, I will start the game”.
Find the probability that Ruchi will start the game.

$$[1+1+2=4]$$

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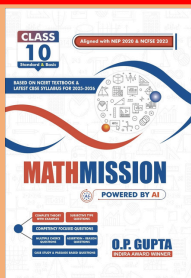
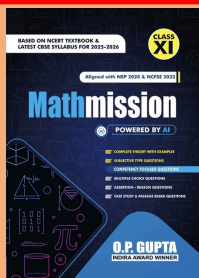
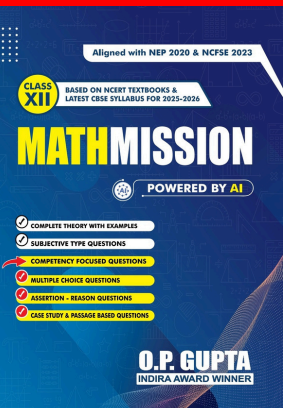
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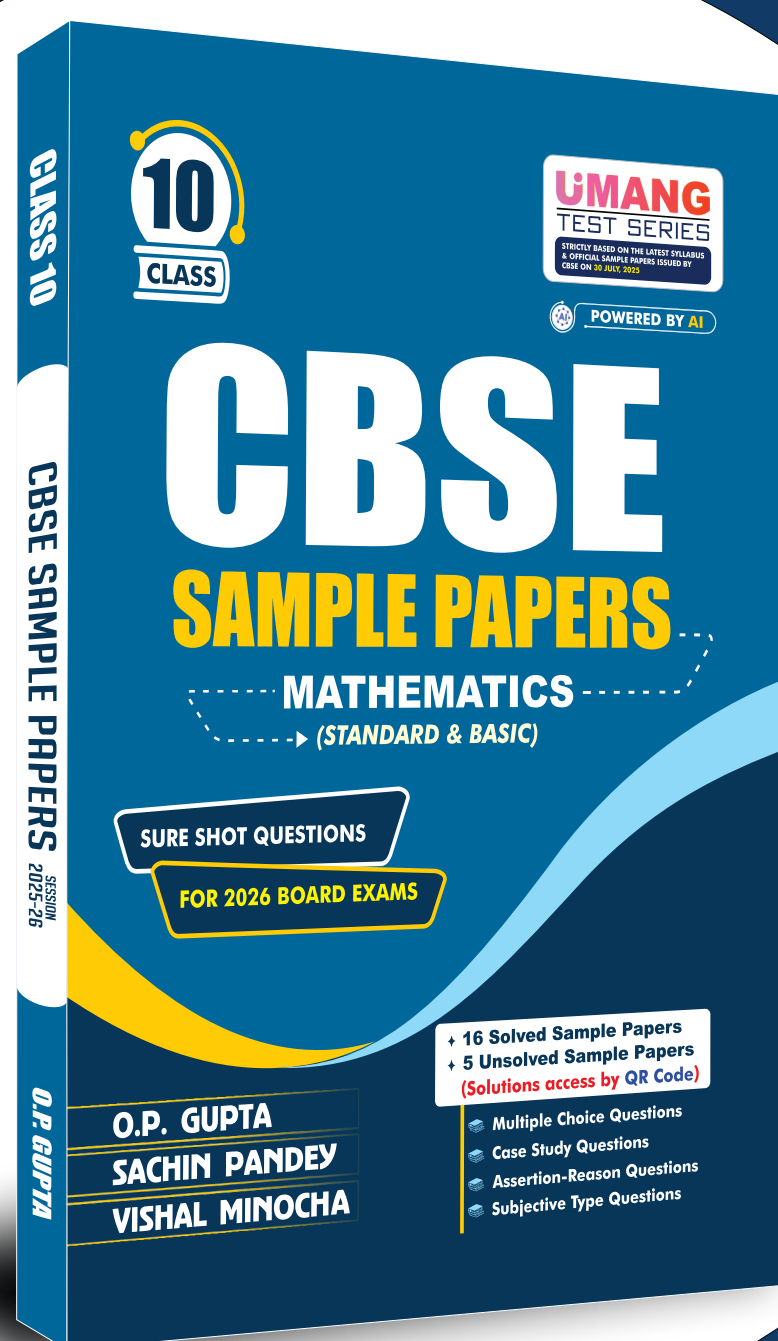
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