

COMBINED TOPIC TEST: CLASS X

Real Numbers & Probability

Time Allowed: 90 Minutes

Based on CBSE PYQs (2022-2024)

Maximum Marks: 40

GENERAL INSTRUCTIONS:

- All questions are compulsory.
- The question paper consists of 12 questions divided into two sections: Section A (Real Numbers) and Section B (Probability).
- Use of calculators is strictly prohibited.
- Show all necessary calculations clearly alongside the answers.

SECTION A: REAL NUMBERS (20 MARKS)

Q1. If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$, where x, y are prime numbers, then find $HCF(a, b)$. [1 M]

- (a) xy (b) xy^2
(c) x^3y^3 (d) x^2y^2

Q2. Find the HCF and LCM of 306 and 657 using the prime factorization method. [2 M]

Q3. Without actual division, determine whether the rational number $\frac{13}{3125}$ will have a terminating or non-terminating repeating decimal expansion. [2 M]

Q4. Prove that $\sqrt{5}$ is an irrational number. [3 M]

Q5. Prove that $3 + 2\sqrt{5}$ is irrational, given that $\sqrt{5}$ is irrational. [3 M]

Q6. An army contingent of 616 members is to march behind an army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march? [4 M]

Q7. Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers. [5 M]

SECTION B: PROBABILITY (20 MARKS)

Q8. Which of the following cannot be the probability of an event? [1 M]

- (a) $\frac{2}{3}$ (b) -1.5
(c) 15% (d) 0.7

Q9. If the probability of an event happening is 0.85, what is the probability of the event not happening? [2 M]

Q10. A die is thrown once. Find the probability of getting: **[3 M]**

- (i) A prime number.
- (ii) A number lying between 2 and 6.
- (iii) An odd number.

Q11. A bag contains 5 red balls, 8 white balls, and 4 green balls. One ball is taken out of the bag at random. What is the probability that the ball taken out will be: **[4 M]**

- (i) Red?
- (ii) White?
- (iii) Not green?

Q12. (Case Study Based) One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting: **[5 M]**

- (i) A king of red colour.
- (ii) A face card.
- (iii) A red face card.
- (iv) The jack of hearts.
- (v) A spade.