

MATHEMATICS CLASS TEST

Class X
Subject: Mathematics

Max. Marks: 20
Time: 40 Minutes

General Instructions:

- All questions are compulsory.
- This question paper contains four sections: Section A, B, C, and D.
- **Section A** comprises 5 questions of 1 mark each (MCQs and Assertion-Reasoning).
- **Section B** comprises 2 questions of 2 marks each (Very Short Answer Type).
- **Section C** comprises 2 questions of 3 marks each (Short Answer Type).
- **Section D** comprises 1 question of 5 marks (Long Answer Type).

SECTION A

(1 mark each)

1. If the HCF of 96 and 404 is 4, then their LCM is:
(a) 9696 (b) 9797 (c) 9898 (d) 9640
2. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is:
(a) 10 (b) -10 (c) 5 (d) -5
3. A card is drawn at random from a well-shuffled deck of 52 playing cards. The probability of getting a face card is:
(a) $\frac{1}{13}$ (b) $\frac{3}{13}$ (c) $\frac{4}{13}$ (d) $\frac{1}{4}$

Directions for Q4 and Q5: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option as:

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
 - (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
 - (c) Assertion (A) is true but Reason (R) is false.
 - (d) Assertion (A) is false but Reason (R) is true.
4. **Assertion (A):** The pair of linear equations $x + 2y - 5 = 0$ and $2x + 4y - 10 = 0$ has infinitely many solutions.
Reason (R): A pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has infinitely many solutions if they represent parallel lines.
 5. **Assertion (A):** The quadratic equation $x^2 - 4x + 5 = 0$ has two distinct real roots.
Reason (R): A quadratic equation $ax^2 + bx + c = 0$ has real and distinct roots if its discriminant $D = b^2 - 4ac > 0$.

SECTION B

(2 marks each)

6. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - p(x+1) - c$, show that $(\alpha + 1)(\beta + 1) = 1 - c$.
7. Evaluate the following expression:

$$\frac{\sin^3 \theta + \cos^3 \theta}{\sin \theta + \cos \theta} + \sin \theta \cos \theta$$

SECTION C

(3 marks each)

8. Two dice are rolled simultaneously. What is the probability that:
- (i) the sum of the numbers appearing on the two dice is 8?
 - (ii) both the dice show the same number (a doublet)?
9. Solve the following pair of linear equations algebraically for x and y :

$$\begin{aligned}\frac{x}{a} + \frac{y}{b} &= a + b \\ \frac{x}{a^2} + \frac{y}{b^2} &= 2\end{aligned}$$

SECTION D

(5 marks each)

10. The sum of the squares of the digits of a two-digit number is 40. The number obtained by interchanging the digits is 36 less than the original number. Find the original number.