

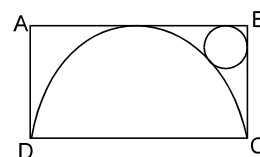
Topics : Fundamentals of Mathematics, Circle, Quadratic Equation

Type of Questions		M.M., Min.
Single choice Objective (no negative marking) Q.1, 2, 3, 4, 5	(3 marks, 3 min.)	[15, 15]
Multiple choice objective (no negative marking) Q.6	(5 marks, 4 min.)	[5, 4]
Subjective Questions (no negative marking) Q.7	(4 marks, 5 min.)	[4, 5]
Fill in the Blanks (no negative marking) Q.8, 9	(4 marks, 4 min.)	[8, 8]
Match the Following (no negative marking) Q.10	(8 marks, 8 min.)	[8, 8]

1. If $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ is a polynomial such that when it is divided by $(x - 1)$ and $(x + 1)$ the remainders are 5 and 19 respectively. If $f(x)$ is divided by $(x - 2)$, then remainder is :
- (A) 0 (B) 5 (C) 10 (D) 2

2. The figure shows a rectangle ABCD with a semi-circle and a circle inscribed inside it as shown. What is the ratio of the area of the circle to that of the semi-circle?

- (A) $(\sqrt{2}-1)^2$
(B) $2(\sqrt{2}-1)^2$
(C) $(\sqrt{2}-1)^2/2$
(D) None of these



3. A 3-digit number has, from left to right, the digits a, b and c with $a > c$. When the number with the digits reversed is subtracted from the original number, the unit's digit in the difference is 4. The next two digits, from right to left, are

- (A) 5 and 9 (B) 9 and 5 (C) 5 and 4 (D) 4 and 5

4. The cubic polynomial $P(x)$ satisfies the condition that $(x - 1)^2$ is a factor of $P(x) + 2$, and $(x + 1)^2$ is a factor of $P(x) - 2$. Then $P(3)$ equals.

- (A) 27 (B) 18 (C) 12 (D) 6

5. If $a + b + c = 0$ & $a^2 + b^2 + c^2 = 1$ then the value of $a^4 + b^4 + c^4$ is

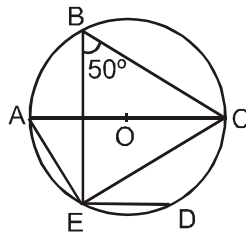
- (A) 1 (B) 4 (C) $\frac{1}{2}$ (D) $\frac{1}{4}$

6. The equation $\frac{2x^3 - 3x^2 + x + 1}{2x^3 - 3x^2 - x - 1} = \frac{3x^3 - x^2 + 5x - 13}{3x^3 - x^2 - 5x + 13}$ has

- (A) at least one real solution (B) exactly three real solution
(C) exactly one irrational solution (D) complex roots

7. If $x + y + z = 1$, $x^2 + y^2 + z^2 = 2$ and $x^3 + y^3 + z^3 = 3$. Find value of $x \cdot y \cdot z$.

8. In the given figure the chord ED is parallel to the diameter AC of the circle with centre O, then $\angle CED$ is equal to



9. If the number A 3 6 4 0 5 4 8 9 8 1 2 7 0 6 4 4 B is divisible by 99 then the ordered pair of digits (A, B) is _____ .

10. Match the following

Column – I

- (A) Even number
(B) Rational number
(C) Irrational number
(D) Real number

Column – II

- (p) $\frac{22}{7}$
(q) π
(r) 0
(s) $\sqrt{2}$
(t) $1.\overline{234}$

Answers Key

1. (C) 2. (D) 3. (B) 4. (B)

5. (C) 6. (A, B, D) 7. $\frac{1}{6}$

8. 40° 9. (9, 1)

10. (A) $\rightarrow$ (r), (B) $\rightarrow$ (p, r, t), (C) $\rightarrow$ (q, s), (D) $\rightarrow$ (p, q, r, s, t)