परमाणु ऊर्जा शिक्षा संस्था , मुंबई

Atomic Energy Education Society, Mumbai

Session : 2023 – 24

Class : IX **Subject: MATHEMATICS**

WORKSHEET NO.- 1

Name of the Chapter : POLYNOMIALS (CHAPTER – 2)

General Instructions:

1. There are 5 sections in this worksheet.
2. Section – A has 10 multiple choice questions of 1 mark each.
3. Section – B has 10 very short answer questions of 1 mark each.
4. Section – C has 10 short answer questions of 2 marks each.
5. Section – D has 5 short answer questions of 3 marks each.
6. Section – E has 5 long answer questions of 5 marks each.
7. Draw neat diagrams wherever necessary.
8. Use of calculator is not permitted.

SECTION – A (1 X 10 = 10)

1 If x - 2 is a factor of $x^2 + 3ax - 2a$, then a = **[1]**

a) 1

b) - 1

c) 2

d) - 2

2 The degree of the polynomial $(x^3 - 2)(x^2 - 11)$ is **[1]**

a) 0

b) 5

c) 3

d) 2

3 If $p(x) = x^2 - 2\sqrt{2}x + 1$, then $p(2\sqrt{2})$ is equal to **[1]**

a) 1

b) $8\sqrt{2} + 1$

c) 0

d) $4\sqrt{2}$

4   If both x - 2 and $x - \frac{1}{2}$ are the factors of $px^2 + 5x + r$, then   **[1]**

a) none of these

b) 2p = r

c) p = r

d) p = 2r

5   $6x^2 + 17x + 5 = ?$ **[1]**

a) (6x + 5) (x + l)

b) None of these

c) (2x + 5) (3x + 1)

d) (2x +1) (3x + 5)

6   The zero of the polynomial $(x - 2)^2 - (x +2)^2$ is   **[1]**

a) 0

b) 2

c) 1

d) - 2

7   If $x^2 - 1$ is a factor of $ax^4 + bx^3 + cx^2 + dx + e$, then   **[1]**

a) a + c + e = b + d

b) a + b + c = d + e

c) b + c + d = a + e

d) a + b + e = c + d

8   If $49x^2 - k = \left(7x + \frac{1}{3}\right)\left(7x - \frac{1}{3}\right)$, then the value of **k** is   **[1]**

a) $\frac{-1}{9}$

b) $\frac{1}{9}$

c) $\frac{1}{3}$

d) $\frac{-1}{3}$

9   If $10x - 4x^2 - 3$, then the value of $p(0) + p(1)$ is   **[1]**

a) - 3

b) 0

c) 3

d) 1

10   Which of the following is a factor of $(x + y)^3 - (x^3 + y^3)$?   **[1]**

a) $x^2 + y^2 + 2xy$

b) xy^2

c) $3xy$

d) $x^2 + y^2 - xy$

SECTION – B (1 X 10= 10)

11   Evaluate: $(5a - 3b)^3$.   **[1]**
12   Factorise: $18x^2 + 3x - 10$.   **[1]**
13   Is it polynomial? In case of a polynomial, write its degree: $x^5 - 2x^3 + x + \sqrt{3}$ **[1]**
14   Factorise: $4x^2 - 9y^2 - 2x - 3y$.   **[1]**
15   Factorise: $x^2 - (a + b)x + ab$ **[1]**
16   Expand: $(3x + 2)^3$.   **[1]**
17   Evaluate: $(995)^2$.   **[1]**
18   Factorise: $1 - 64a^3$.   **[1]**
19   If p(x) = 5 - 4x + 2x^2 , find p(0)   **[1]**
20   Factorise: a(a - 2b - c) + 2bc   **[1]**

SECTION – C(2 X 10=20)

21   Find $p(0), p(1)$ and $p(2)$ of the polynomials: $p(t) = 2 + t + 2t^2 - t^3$ **[2]**
22   Factorize: $x(x^3 - y^3) + 3xy(x - y)$ **[2]**
23   If x - 2 is a factor of polynomial, $x^3 - 2ax^2 + ax - 1$, then find the value of a.   **[2]**
24   Expand $(2x + 1)^3$ using suitable identity   **[2]**
25   Factorise: $5\sqrt{5}x^2 + 30x + 8\sqrt{5}$ by splitting the middle term.   **[2]**

26 Evaluate the following product without multiplying directly : 95 × 96 **[2]**

27 Use factor theorem to show that $x^4 + 2x^3 - 2x^2 + 2x - 3$ is exactly divisible by $(x + 3)$. **[2]**

28 Factorise:$2\sqrt{2}a^3 + 16\sqrt{2}b^3 + c^3 - 12abc$. **[2]**

29 Find the zeroes of the polynomial$(x - 2)^2 - (x + 2)^2$. **[2]**

30 Factorise:$\frac{3}{2}x^2 + 16x + 10$. **[2]**

SECTION – D (3 X 5 = 15)

31 Factorize:$a^2 x^2 + (ax^2 + 1)x + a$ **[3]**

32 Find the value of a such that $(x - 4)$ is a factor of$5x^3 - 7x^2 - ax - 28$ **[3]**

33 Factorise:$1 - a^2 - b^2 - 2ab$ **[3]**

34 Factorize:$4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$ **[3]**

35 Factorise: $4x^2 + 20x + 25$ **[3]**

SECTION – E(5 X 5 = 25)

36 Show that $(x – 2)$, $(x + 3)$ and $(x – 4)$ are the factors of$x^3 - 3x^2 - 10x + 24$ **[5]**

37 Ifα and β are the zeroes of the polynomial $2x^2 - 4x + 5$, find the values of : **[5]**

  1. $\alpha^2 + \beta^2$

  2. $\frac{1}{\alpha} + \frac{1}{\beta}$

  3. $(\alpha - \beta)^2$

  4. $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$

  5. $\alpha^3 + \beta^3$

38 If a + b + c = 5 and ab + bc + ca = 10, then prove that$a^3 + b^3 + c^3 - 3abc = -25$ **[5]**

39 If both x + 1 and x - 1 and factors of $ax^3 + x^2 - 2x + b$, find the values of a and b. **[5]**

40 If $x = -\frac{1}{2}$ is a zero of the polynomial p(x) = $8x^3 - ax^2 - x + 2$, find the value of a. **[5]**

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