DEVESH TEDIA CLASSES

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D.T.CLASSES

Class 09 - Mathematics

Section A

1. A polynomial containing three non-zero terms is called a _____. **[1]**

   a) trinomial
   b) quadrinomial
   c) monomial
   d) binomial

2. The value of $\frac{0.75\times0.75\times0.75+0.25\times0.25\times0.25}{0.75\times0.75-0.75\times0.25+0.25\times0.25}$ is **[1]**

   a) 0
   b) 2
   c) 1
   d) -1

3. If $3x+\frac{2}{x}=7$, then $\left(9x^2-\frac{4}{x^2}\right)$ = **[1]**

   a) 49
   b) 25
   c) 30
   d) 35

4. $\sqrt{2}$ is a polynomial of degree **[1]**

   a) 1
   b) 2
   c) $\sqrt{2}$
   d) 0

5. The value of k for which (x - 1) is a factor of $9x^2 + kx - 18$ is _____. **[1]**

   a) -9
   b) 9
   c) 0
   d) 5

6. The factors of $x^3 - x^2y - xy^2 + y^3$, are **[1]**

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

7. The zeros of the polynomial $4x^2+5\sqrt{2}x-3$ are **[1]**

   a) $-3\sqrt{2},\frac{\sqrt{2}}{2}$
   b) $\frac{-3\sqrt{2}}{2},\frac{\sqrt{2}}{4}$
   c) $-3\sqrt{2},\sqrt{2}$
   d) $-3\sqrt{2},\frac{\sqrt{3}}{2}$

8. If a - b = -8 and ab = -12, then $a^3 - b^3$ = **[1]**

   a) -240
   b) -244
   c) -224
   d) -260

9. $6x^2 + 17x + 5$ = ? **[1]**

   a) (5x + 2) (2x + 1)
   b) (2x +1) (3x + 5)
   c) (2x + 5) (3x + 1)
   d) (6x + 5) (x + 1)

10. (x + 1) is a factor of x^n +1 only if **[1]**

a) n is an odd integer

b) n is a positive integer

c) n is a negative integer

d) n is an even integer

11. The degree of a biquadratic polynomial is **[1]**

a) 3

b) 1

c) 2

d) 4

12. If (x^{100} + $2x^{99}$ + k) is divisible by (x + 1) then the value of k is **[1]**

a) -3

b) -2

c) 2

d) 1

13. If $x + y = 8$ and $xy = 15$, then $x^2 + y^2$ **[1]**

a) 34

b) 36

c) 1

d) 32

14. If x = $\left(5 - 2\sqrt{6}\right)$, then $\left(x^2 + \frac{1}{x^2}\right)$ = _____. **[1]**

a) 12

b) 58

c) 98

d) 0

15. The factors of a^2 - 1 - 2x - x^2, are **[1]**

a) (a + x - 1) (a - x + 1)

b) (a - x + 1) (a - x - 1)

c) (a - x - 1) (a + x - 1)

d) (a + x + 1) (a - x - 1)

16. Which of the following is a polynomial. **[1]**

a) $\frac{1}{x}$ + 5

b) -4

c) x - $\frac{1}{x}$ + 2

d) $\sqrt{x}$ + 3

17. The number of quadratic polynomials having zeroes -1 and 3 is: **[1]**

a) 3

b) 1

c) more than 3

d) 2

[2024]

18. When p(x) = $4x^3$ - $12x^2$ + 11x - 5 is divided by (2x - 1), the remainder is **[1]**

a) 0

b) -2

c) -5

d) 2

19. The zeros of the polynomial p(x) = $2x^2$ + 7x - 4 are **[1]**

a) -4, $\frac{1}{2}$

b) -4, $\frac{-1}{2}$

c) 4, $\frac{1}{2}$

d) 4, $\frac{-1}{2}$

20. If x^{51} + 51 is divided by x + 1, then the remainder is **[1]**

a) 0

b) 50

c) 51 d) 1

21. Vikas has ₹(x^3 + 2ax) with this money he can buy exactly (x - 1) jeans or (x + 1) shirts with no money left. How much money Vikas has, if x = 4? **[1]**

a) ₹ 120 b) ₹ 60

c) ₹ 80 d) ₹ 30

22. 75 $\times$ 75 + 2 $\times$ 75 $\times$ 25 + 25 $\times$ 25 is equal to **[1]**

a) 3750 b) 7500

c) 10000 d) 6250

23. (x - y) (x + y) (x^2 + y^2) (x^4 + y^4) is equal to **[1]**

a) x^8 - y^8 b) x^8 + y^8

c) x^{16} - y^{16} d) x^{16} + y^{16}

24. The degree of the zero polynomial is **[1]**

a) not defined b) 1

c) any natural number d) 0

25. The zero of the polynomial p(x) = 5x – 2 is **[1]**

a) $\frac{-5}{2}$ b) $\frac{5}{2}$

c) $\frac{2}{5}$ d) $\frac{-2}{5}$

26. The factorisation of $4x^2$ + 8x + 3 is **[1]**

a) (2x + 2) (2x + 5) b) (2x + 1) (2x + 3)

c) (x + 1) (x + 3) d) (2x –1) (2x –3)

27. When p(x) = x^3 + ax^2 + 2x + a is divided by x + a, the remainder is **[1]**

a) a b) 1

c) 0 d) -a

28. (207 $\times$ 193) = ? **[1]**

a) 39961 b) 39851

c) 38951 d) 39951

29. For what value of k is the polynomial p(x) = $2x^3$ - kx^2 + 3x +10 exactly divisible by (x + 2)? **[1]**

a) $-\frac{1}{3}$ b) $\frac{1}{3}$

c) 3 d) -3

30. If $\frac{a}{b} + \frac{b}{a} = 1$, then a^3 + b^3 = **[1]**

a) -1 b) 1

c) 1/2 d) 0

31. **Assertion (A):** If (x) + 1 is a factor of f(x) = x^2 + ax + 2, then a = -3. **[1]**
Reason (R): If (x - a) is a factor of p(x), if p(a) = 0.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

32. **Assertion (A):** If p(x) = ax + b, $a \neq 0$ is a linear polynomial, then x = $\frac{-b}{a}$ is the only zero of p(x). **[1]**

Reason (R): A linear polynomial has one and only one zero.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

33. **Assertion (A):** P(x) = $4x^3 - x^2 + 5x^4 + 3x - 2$ is a polynomial of degree 3. **[1]**

Reason (R): The highest power of x in the polynomial P(x) is the degree of the polynomial.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

34. **Assertion:** Degree of a zero polynomial is not defined. **[1]**

Reason: Degree of a non-zero constant polynomial is 0

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is wrong statement.

d) Assertion is wrong statement but reason is correct statement.

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35. **Assertion (A):** If the graph of a polynomial touches x-axis at only one point, then the polynomial cannot be a quadratic polynomial. **[1]**

Reason (R): A polynomial of degree n(n > 1) can have at most n zeroes.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

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36. **Assertion (A):** Graph of linear polynomial always meets x-axis at 3 points. **[1]**

Reason (R): Degree of linear polynomial is one.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

37. **Assertion (A):** Number zero itself is known as zero polynomial. **[1]**

Reason (R): Zero polynomial has only one zero.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

38. **Assertion (A):** The degree of the polynomial (x - 2)(x - 3)(x + 4) is 4. **[1]**
Reason (R): The number of zeroes of a polynomial is the degree of that polynomial.

a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

39. **Assertion (A):** Polynomial (x + 1) (x^2 – 4) (x + 5) has at most 4 zeroes. **[1]**
Reason (R): Degree of given polynomial is 4.

a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

40. **Assertion (A):** (x + 2) is a factor of $x^3 + 3x^2 + 5x + 6$ and of 2x + 4. **[1]**
Reason (R): If p(x) be a polynomial of degree greater than or equal to one, then (x - a) is a factor of p(x), if p(a) = 0.

a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

Section B

41. Using factor theorem, show that g(x) is a factor of p(x), when $p(x) = 7x^2 - 4\sqrt{2}x - 6$, $g(x) = x - \sqrt{2}$. **[2]**
42. Factorise: $(p + q)^2 - 20(p + q) - 125$. **[2]**
43. If $p(x) = 2x^3 - 11x^2 - 4x + 5$ and g(x) = 2x + 1, show that g(x) is not a factor of p(x). **[2]**
44. Verify $x = -\frac{1}{2}$ are zeroes of the polynomial $p(x) = 2x + 1$ **[2]**
45. Verify: $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$ **[2]**
46. Factorise: $\frac{3}{2}x^2 + 16x + 10$. **[2]**
47. Factorize: $8a^3 - b^3 - 4ax + 2bx$ **[2]**
48. Factorize: $x^2 + 6\sqrt{2}x + 10$ **[2]**
49. Write in expanded form: $\left(\frac{1}{3x} - \frac{2}{5y}\right)^3$ **[2]**
50. Verify that 2 and -3 are the zeros of the polynomial, $q(x) = x^2 + x - 6$ **[2]**
51. Without finding the cubes, factorise: $(2r - 3s)^3 + (3s - 5t)^3 + (5t - 2r)^3$. **[2]**
52. Verify $x = \frac{4}{5}$ is a zero of the polynomial $p(x) = 5x - \pi$ **[2]**

Section C

53. Verify that $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x + y + z)[(x - y)^2 + (y - z)^2 + (z - x)^2]$. **[3]**
54. Factorise: $1 - a^2 - b^2 - 2ab$ **[3]**
55. Find the value of m so that 2x - 1 be a factor of $8x^4 + 4x^3 - 16x^2 + 10x + m$. **[3]**
56. Factorize: $x^3 + 13x^2 + 32x + 20$ **[3]**
57. The polynomials $ax^3 + 3x^2 - 3$ and $2x^3 - 5x + a$ when divided by (x - 4) leave the remainders R_1 and R_2 respectively. Find the values of a if $2R_1 - R_2 = 0$ **[3]**

58. If both x - 2 and $x - \frac{1}{2}$ are factors of $px^2 + 5x + r$, show that p = r. **[3]**

59. Factorise: $x^6 - 64$ **[3]**

60. Find the remainder when $x^3 + 3x^2 + 3x + 1$ is divided by $5 + 2x$ **[3]**

61. For what value of m is $x^3 - 2mx^2 + 16$ divisible by x + 2? **[3]**

62. Find the remainder when f(x) is divided by g(x) and verify the result by actual division: $f(x) = x^3 - 6x^2 + 2x - 4$, g(x) = 1 - 2x **[3]**

Section D

63. **Read the following text carefully and answer the questions that follow:** **[4]**

In a particular class of x students, $\frac{1}{12}$th times the square of the total number of students planned to visit historical monuments. $\frac{7}{12}$th times the number of students planned to visit old age homes while 10 students decided to teach poor children.

i. What is the total number of students in a polynomial in terms of x? (1)

ii. What is the degree of the polynomial $p(x) = x^2 + \frac{7}{12}x + 10$? (1)

iii. How many students planned to visit the historical monuments if x = 96? (2)

OR

How many students are planning to visit old age homes if x = 96? (2)

64. **Read the following text carefully and answer the questions that follow:** **[4]**

Beti Bacho, Beti Padho (BBBP) is a personal campaign of the Government of India that aims to generate awareness and improve the efficiency of welfare services intended for girls.

In a school, a group of (x + y) teachers, $(x^2 + y^2)$ girls and $(x^3 + y^3)$ boys organised a campaign on Beti Bacho, Beti Padho.

i. How many teachers are there in the group if there are 63 girls (given xy = 9)? (1)

ii. How many girls are there in the group if there are 10 teachers and 370 boys? (1)

iii. How many boys are there in the group if there are 10 teachers and 58 girls? (2)

OR

What is the value of $(x^2 - y^2)$ if the number of teaches are 10 (given (x - y) = 23)? (2)

65. **Read the following text carefully and answer the questions that follow:** **[4]**

National Association For The Blind (NAB) aimed to empower and well-inform visually challenge population of our country, thus enabling them to lead a life of dignity and productivity.

Ravi donated ₹($x^3 + \frac{1}{x^3}$) to NAB. When his cousin asks to tell the amount donated by him, he just gave the below hint.

$x + \frac{1}{x} = 10$

i. When (x + a)(x + b) is expanded, what is the resulting expression in the form of (x^2 + _____ x + ab). (1)

ii. What is the mathematical formula for the identity represented as $(x - y)^3$? (1)

iii. What is the amount donated by Ravi? (2)

OR

What is the amount donated by Ravi if $x + \frac{1}{x} = 7$. (2)

Section E

66. What must be added to $x^3 - 6x^2 - 15x + 80$ so that the result is exactly divisible by $x^2 + x - 12$ **[5]**

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

68. If x - 3 and $x - \frac{1}{3}$ are both factors of $px^2 + 5x + r$, then show that p = r **[5]**

69. If the polynomials $2x^3 + ax^2 + 3x - 5$ and $x^3 + x^2 - 4x + a$ leave the same remainder when divided by x - 2, Find the value of a **[5]**

70. Prove that $(a+b+c)^3 - a^3 - b^3 - c^3 = 3(a+b)(b+c)(c+a)$ **[5]**

71. Find the values of a and b so that the polynomial ($x^4 + ax^3 - 7x^2 - 8x + b$) is exactly divisible by (x + 2) as well as (x + 3). **[5]**

72. The polynomials ($2x^3 + x^2 - ax + 2$) and ($2x^3 - 3x^2 - 3x + a$) when divided by (x - 2) leave the same remainder. Find the value of a. **[5]**

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

74. Using factor theorem, factorize the polynomial: $x^4 + 10x^3 + 35x^2 + 50x + 24$ **[5]**

75. If the two zeroes of the polynomial $x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$, find other zeroes. **[5]**