

**CHOOSE THE CORRECT ONE**

1. A cubic polynomial is a polynomial with degree  
(A) 1 (B) 3 (C) 0 (D) 2
2. A polynomial of degree 5 in  $x$  has at most  
(A) 5 terms (B) 4 terms (C) 6 terms (D) 10 terms
3. The coefficient of  $x^3$  in the polynomial  $5 + 2x + 3x^2 - 7x^3$  is  
(A) 5 (B) 2 (C) 7 (D) -7
4. The value of  $P(x) = x^2 - 7x + 12$  at  $x = 3$  is :-  
(A) 42 (B) 0 (C) 8 (D) -6
5. A linear polynomial :-  
(A) may have no zero (B) may have one zero  
(C) has one and only one zero always (D) may have more than one zero
6. The zeroes of the polynomial  $p(x) = x(x - 1)(x - 2)$  are :-  
(A) 0 (B) 0, -1, -2 (C) 0, 1, -2 (D) 0, 1, 2
7. When the polynomial  $x^3 + 3x^2 + 3x + 1$  is divided by  $x + 1$ , the remainder is :-  
(A) 1 (B) 8 (C) 0 (D) -6
8. If the polynomial  $2x^3 - 3x^2 + 2x - 4$  is divided by  $x - 2$ , then the remainder is :-  
(A) -4 (B) 4 (C) -40 (D) 2
9. The value of  $k$  for which  $x - 1$  is a factor of the polynomial  $4x^3 + 3x^2 - 4x + k$  is :-  
(A) 3 (B) 0 (C) 1 (D) -3
10. The value of  $k$  for which  $x + 1$  is a factor of the polynomial  $x^3 + x^2 + x + k$  is :-  
(A) 0 (B) 2 (C) 1 (D) -1
11. The value of  $m$  for which  $x - 2$  is a factor of the polynomial  $x^4 - x^3 + 2x^2 - mx + 4$  is :-  
(A) 10 (B) -10 (C) 4 (D) 9
12. The factors of  $2x^2 - 3x - 2$  are :-  
(A)  $(2x - 1)(x + 2)$  (B)  $(2x + 1)(x - 2)$  (C)  $(x + 1)(x - 2)$  (D)  $(x - 1)(x + 2)$

13. The factors of  $12x^2 - x - 6$  are  
 (A)  $(3x - 2)(4x + 3)$  (B)  $(12x + 1)(x - 6)$  (C)  $(3x + 2)(4x - 3)$  (D)  $(12x - 1)(x + 6)$
14. The factors of  $x^3 - 2x^2 - 13x - 10$  are :-  
 (A)  $(x - 1)(x + 2)(x + 5)$  (B)  $(x - 1)(x - 2)(x - 5)$   
 (C)  $(x + 1)(x - 2)(x + 5)$  (D)  $(x + 1)(x + 2)(x - 5)$
15. The expanded form of  $(2x - 3y - z)^2$  is :-  
 (A)  $4x^2 + 9y^2 + z^2 - 6xy + 3yz - 2zx$  (B)  $4x^2 + 9y^2 + z^2 + 6xy + 6yz - 2zx$   
 (C)  $4x^2 + 9y^2 + z^2 - 12xy - 6yz - 4zx$  (D)  $4x^2 + 9y^2 + z^2 - 12xy + 6yz - 4zx$
16. The expanded form of  $(x + y + 2z)^2$  is :-  
 (A)  $x^2 + y^2 + 4z^2 + 2xy + 2yz + 2zx$  (B)  $x^2 + y^2 + 4z^2 + xy + 2yz + 2zx$   
 (C)  $x^2 + y^2 + 4z^2 + 2xy + 4yz + 4zx$  (D)  $x^2 + y^2 + 4z^2 + 2xy + 2yz + 4zx$
17. The expanded form of  $\left(x + \frac{1}{3}\right)^3$  is :-  
 (A)  $x^3 + \frac{1}{9} + 3x^2 + 3x$  (B)  $x^3 + \frac{1}{27} + x^2 + \frac{1}{3}x$   
 (C)  $x^3 + \frac{1}{27} + 3x^2 + x$  (D)  $x^3 + \frac{1}{27} + 3x^2 + \frac{1}{3}x$
18.  $x^3 + y^3 + z^3 - 3xyz$  is :-  
 (A)  $(x + y - z)$  (B)  $(x - y + z)^3$   
 (C)  $(x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$  (D)  $(x + y + z)^3 - 3xyz$
19.  $(a - b)^3 + (b - c)^3 + (c - a)^3$  is equal to :-  
 (A)  $3abc$  (B)  $3a^3b^3c^3$   
 (C)  $3(a - b)(b - c)(c - a)$  (D)  $[a - (b + c)]^3$
20.  $\frac{0.83 \times 0.83 \times 0.83 + 0.17 \times 0.17 \times 0.17}{0.83 \times 0.83 - 0.83 \times 0.17 + 0.17 \times 0.17}$  is equal to :-  
 (A) 1 (B)  $(0.83)^3 + (0.17)^3$  (C) 0 (D) None of these

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## EXERCISE # 1 ANSWER KEY OBJECTIVE QUESTIONS

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	B	C	D	A	C	D	C	B	D	C
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	A	B	C	D	D	C	B	C	C	A

**EXERCISE # 3****FOR OLYMPIADS QUESTIONS**

1. If  $\left(x + \frac{1}{x}\right) = 4$ , then  $\left(x^4 + \frac{1}{x^4}\right)$  is equal to :-  
(A) 196 (B) 194 (C) 192 (D) 190
2. If  $\left(x^2 + \frac{1}{x^2}\right) = 102$ , the value of  $\left(x - \frac{1}{x}\right)$  is :-  
(A) 8 (B) 10 (C) 12 (D) 13
3. If  $\left(x^3 + \frac{1}{x^3}\right) = 52$ , the value of  $\left(x + \frac{1}{x}\right)$  is :-  
(A) 4 (B) 3 (C) 6 (D) 13
4. If  $\left(x^3 - \frac{1}{x^3}\right) = 14$ , the value of  $\left(x - \frac{1}{x}\right)$  is :-  
(A) 5 (B) 4 (C) 3 (D) 2
5. If  $x$  is an integer such that  $\left(x + \frac{1}{x}\right) = \left(\frac{17}{4}\right)$ , then the value of  $\left(x - \frac{1}{x}\right)$  is :-  
(A) 4 (B)  $\frac{13}{4}$  (C)  $\frac{15}{4}$  (D)  $\frac{1}{4}$
6. If  $t^2 - 4t + 1 = 0$ , then the value of  $\left(t^3 + \frac{1}{t^3}\right)$  is :-  
(A) 44 (B) 48 (C) 52 (D) 64
7. If  $x + y = 5$  and  $xy = 6$ , the value of  $(x^3 - y^3)$  is :-  
(A) -19 (B) 19 (C) -63 (D) 63
8. If  $\frac{5^x}{125} = 1$ , then  $x$  is equal to :-  
(A) 5 (B) 2 (C) 0 (D) 3
9. If  $2^x - 2^{x-1} = 16$ , then the value of  $x^2$  is :-  
(A) 4 (B) 9 (C) 16 (D) 25
10. If  $x$  and  $y$  are non-zero rational unequal numbers, then  $\frac{(x+y)^2 - (x-y)^2}{x^2y - xy^2}$  is equal to :-  
(A)  $\frac{1}{xy}$  (B)  $\frac{1}{x-y}$  (C)  $\frac{4}{x-y}$  (D)  $\frac{2}{x-y}$
11. If  $\frac{x}{(b-c)(b+c-2a)} = \frac{y}{(c-a)(c+a-2b)} = \frac{z}{(a-b)(a+b-2c)}$ , the value of  $(x + y + z)$  is :-  
(A)  $a + b + c$  (B)  $a^2 + b^2 + c^2$  (C) 0 (D) indeterminate

12. If  $(x - 2)$  is a factor of  $(x^2 + 3qx - 2q)$ , then the value of  $q$  is :-  
(A) 2 (B) -2 (C) 1 (D) -1
13. Which of the following statements are correct ?  
1.  $x + 3$  is a factor of  $x^3 + 2x^2 + 3x + 18$       2.  $x + 2$  is a factor of  $x^3 + 2x^2 - x - 2$   
3.  $x + 1$  is a factor of  $x^3 + x^2 - 4x - 4$       4.  $x - 2$  is a factor of  $2x^3 - 3x + 4$   
(A) 2, 3, 4 (B) 1, 3, 4 (C) 1, 2, 4 (D) 1, 2, 3
14. If  $(x - a)$  is a factor of  $(x^3 - 3x^2a + 2a^2x + b)$ , then the value of  $b$  is :-  
(A) 0 (B) 2 (C) 1 (D) 3
15. If  $(x + 2)$  and  $(x - 1)$  are the factors of  $(x^3 + 10x^2 + mx + n)$ , the values of  $m$  and  $n$  are :-  
(A)  $m = 5, n = -3$  (B)  $m = 17, n = -8$  (C)  $m = 7, n = -18$  (D)  $m = 23, n = -19$
16. If  $(x^5 - 9x^2 + 12x - 14)$  is divided by  $(x - 3)$ , the remainder is :-  
(A) 184 (B) 56 (C) 2 (D) 1
17. If  $(x^{11} + 1)$  is divided by  $(x + 1)$ , the remainder is :-  
(A) 0 (B) 2 (C) 11 (D) 12
18. The value of expression  $(16x^2 + 24x + 9)$  for  $x = -\frac{3}{4}$  is :-  
(A) 2 (B) 1 (C) 0 (D) -1
19. When  $(x^3 - 2x^2 + px - q)$  is divided by  $(x^2 - 2x - 3)$ , the remainder is  $(x - 6)$ . The values of  $p$  and  $q$  are:-  
(A)  $p = -2, q = -6$  (B)  $p = 2, q = -6$  (C)  $p = -2, q = 6$  (D)  $p = 2, q = 6$
20. For making  $(x^4 - 11x^2y^2 + y^4)$  a perfect square, the expression to be added is :-  
(A)  $5x^2y^2$  (B)  $9x^2y^2$  (C)  $-5x^2y^2$  (D)  $7x^2y^2$
21. The factors of  $(x^4 + 625)$  are :-  
(A)  $(x^2 - 25), (x^2 + 25)$  (B)  $(x^2 + 25), (x^2 + 25)$   
(C)  $(x^2 - 10x + 25), (x^2 + 5x + 25)$  (D) do not exist
22. The factors of  $(x^2 - 8x - 20)$  are :-  
(A)  $(x + 10)(x - 2)$  (B)  $(x - 10)(x - 2)$  (C)  $(x - 5)(x + 4)$  (D)  $(x + 5)(x - 4)$
23. The factors of  $(x^2 - 11xy - 60y^2)$  are :-  
(A)  $(x + 15y)(x - 4y)$  (B)  $(x - 15y)(x + 4y)$  (C)  $(15x + y)(4x - y)$  (D) None of these

24. The factors of  $(216x^3 - 64y^3)$  are :-
- (A)  $8(3x - 2y)(9x^2 + 4y^2 - 6xy)$  (B)  $8(3x - 2y)(9x^2 - 4y^2 - 6xy)$   
(C)  $8(3x - 2y)(9x^2 + 4y^2)$  (D)  $8(3x - 2y)(9x^2 + 4y^2 + 6xy)$
25. The factors of  $(x^3 - 5x^2 + 8x - 4)$  are :-
- (A)  $(x + 2)(x - 2)(x - 1)$  (B)  $(x + 1)(x + 2)(x - 2)$   
(C)  $(x - 2)^2(x - 1)$  (D)  $(x - 2)^2(x + 1)$
26.  $(x + y)^3 - (x - y)^3$  can be factorized as :-
- (A)  $2y(3x^2 + y^2)$  (B)  $2x(3x^2 + y^2)$  (C)  $2y(3y^2 + x^2)$  (D)  $2x(x^2 + 3y^2)$
27. The factors of  $x^3 - 7x + 6$  are :-
- (A)  $x(x - 6)(x - 1)$  (B)  $(x^2 - 6)(x - 1)$   
(C)  $(x + 1)(x + 2)(x - 3)$  (D)  $(x - 1)(x + 3)(x - 2)$
28. If  $a + b + c = 0$ , then  $a^2 + b^2 + c^2$  is :-
- (A)  $-4(ab + bc + ca)$  (B)  $-2(ab + bc + ca)$  (C) 0 (D)  $2a^2 - 2bc$
29. When  $x^{13} + 1$  is divided by  $x + 1$ , the remainder is :-
- (A) -1 (B) 0 (C) 1 (D) 2
30. When  $x^3 + 2x^2 + 2x - 4$  and  $x^3 + 2x^2 - 3x + 6$  are divided by  $x - 2$ , the remainders are  $R_1$  and  $R_2$  respectively. Which of the following statements is true for  $R_1$  and  $R_2$  ?
- (A)  $R_1 = 2R_2$  (B)  $2R_1 = R_2$  (C)  $R_1 = R_2$  (D)  $R_1 + R_2 = 0$

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### EXERCISE # 3

### ANSWER KEY

### OLYMPIAD QUESTIONS

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	B	B	A	D	C	C	B	D	D	C
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	C	D	D	A	C	A	A	C	C	B
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	D	B	B	D	C	A	D	B	B	C