



## SECTION – B(CCT Questions)

Questions 7 to 10 carry 1 mark each.

### CCT Question

In Class VII-A, one day Maths teacher explaining the topic formation of algebraic expression and find the value of expression. He explained that Variables and numbers are used to construct terms. These terms along with a combination of operators constitute an algebraic expression. The algebraic expression has a value that depends on the values of the variables. He explained example, let  $6p^2 - 3p + 5$  be an algebraic expression with variable p

The value of the expression when  $p = 2$  is,  $6(2)^2 - 3(2) + 5$   
 $\Rightarrow 6(4) - 6 + 5 = 23$

**Answer the following questions based on the above information:**

7. The value of expression  $4x - 3$  at  $x = 2$  is  
(a) -4 (b) 5 (c) 4 (d) 2  
Ans: (b) 5
8. The value of expression  $5n^2 + 5n - 2$  for  $n = -2$  is  
(a) 13 (b) 3 (c) 8 (d) 12  
Ans: (c) 8
9. The value of expression  $2a^2 + 2b^2 - ab$  for  $a = 2, b = 1$  is  
(a) 2 (b) 8 (c) 6 (d) 10  
Ans: (b) 8
10. The value of  $x + 7 + 4(x - 5)$  for  $x = 2$   
(a) -3 (b) 31 (c) 12 (d) 37  
Ans: (a) -3

## SECTION – C

Questions 11 to 13 carry 2 marks each.

11. Get the algebraic expressions in the following cases using variables, constants and arithmetic operations.
- (i) Numbers x and y, both squared and added
  - (ii) Number 5 added to three times the product of numbers m and n
  - (iii) Product of numbers y and z subtracted from 10
  - (iv) Sum of numbers a and b subtracted from their product.
- Ans: (i) Numbers x and y, both squared and added =  $x^2 + y^2$   
(ii) Number 5 added to three times the product of numbers m and n =  $3mn + 5$   
(iii) Product of numbers y and z subtracted from 10 =  $10 - (y \times z) = 10 - yz$   
(iv) Sum of numbers a and b subtracted from their product =  $(a \times b) - (a + b)$   
 $= ab - (a + b)$
12. Identify like terms in the following:  $10pq, 7p, 8q, -p^2q^2, -7qp, -100q, -23, 12q^2p^2, -5p^2, 41, 2405p, 78qp, 13p^2q, qp^2, 701p^2$   
Ans: When terms have the same algebraic factors, they are like terms.  
They are,  $10pq, -7qp, 78qp$   
 $7p, 2405p$   
 $8q, -100q$   
 $-p^2q^2, 12q^2p^2$   
 $-23, 41$   
 $-5p^2, 701p^2$   
 $13p^2q, qp^2$

13. Simplify combining like terms:  $3a - 2b - ab - (a - b + ab) + 3ab + b - a$

Ans:  $3a - 2b - ab - (a - b + ab) + 3ab + b - a$   
 $= 3a - 2b - ab - a + b - ab + 3ab + b - a$   
 $= 3a - a - a - 2b + b + b - ab - ab + 3ab$   
 $= a(1 - 1 - 1) + b(-2 + 1 + 1) + ab(-1 - 1 + 3)$   
 $= a(1 - 2) + b(-2 + 2) + ab(-2 + 3)$   
 $= a(1) + b(0) + ab(1) = a + ab$

### SECTION – D

**Questions 14 to 17 carry 3 marks each.**

14. What should be the value of a if the value of  $2x^2 + x - a$  equals to 5, when  $x = 0$ ?

Ans:  
 From the question, it is given that  $x = 0$   
 We have,  $2x^2 + x - a = 5 \Rightarrow a = 2x^2 + x - 5$   
 Then, substitute the value of x in the equation.  
 $a = (2 \times 0^2) + 0 - 5 \Rightarrow a = 0 + 0 - 5 \Rightarrow a = -5$

15. Identify terms which contain  $y^2$  and give the coefficient of  $y^2$ .

(i)  $8 - xy^2$  (ii)  $5y^2 + 7x$  (iii)  $2x^2y - 15xy^2 + 7y^2$

Ans:

Sl.No.	Expression	Terms	Coefficient of $y^2$
(i)	$8 - xy^2$	$-xy^2$	$-x$
(ii)	$5y^2 + 7x$	$5y^2$	5
(iii)	$2x^2y - 15xy^2 + 7y^2$	$-15xy^2$ $7y^2$	$-15x$ 7

16. Find the values of the following expressions for  $x = 2$ .

(i)  $x + 4$  (ii)  $4x - 3$

Ans: Putting  $x = 2$

(i) In  $x + 4$ , we get

$x + 4 = 2 + 4 = 6$

(ii) In  $4x - 3$ , we get

$4x - 3 = (4 \times 2) - 3 = 8 - 3 = 5$

17. Simplify the expression and find its value when  $a = 5$  and  $b = -3$ .

$2(a^2 + ab) + 3 - ab$

Ans: From the question, it is given that  $a = 5$  and  $b = -3$

We have,  $2a^2 + 2ab + 3 - ab = 2a^2 + ab + 3$

Then, substitute the value of a and b in the equation.

$= (2 \times 5^2) + (5 \times (-3)) + 3 = (2 \times 25) + (-15) + 3$

$= 50 - 15 + 3 = 38$

### SECTION – E

**Questions 18 to 20 carry 4 marks each.**

18. (i) If  $z = 10$ , find the value of  $z^3 - 3(z - 10)$ .

(ii) If  $p = -10$ , find the value of  $p^2 - 2p - 100$

Ans: (i) From the question, it is given that  $z = 10$

We have,  $z^3 - 3z + 30$

Then, substitute the value of z in the equation.

$= (10)^3 - (3 \times 10) + 30 = 1000 - 30 + 30 = 1000$

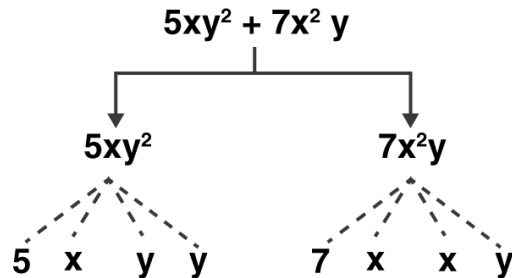
(ii) From the question, it is given that  $p = -10$

We have,  $p^2 - 2p - 100$

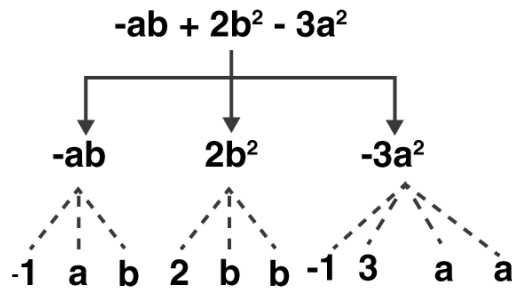
Then, substitute the value of p in the equation.  
 $= (-10)^2 - (2 \times (-10)) - 100 = 100 + 20 - 100 = 20$

19. Identify the terms and their factors in the expressions: (i)  $5xy^2 + 7x^2y$  (ii)  $-ab + 2b^2 - 3a^2$   
 Show the terms and factors by tree diagrams.

Ans: (i) Expression:  $5xy^2 + 7x^2y$   
 Terms:  $5xy^2, 7x^2y$   
 Factors: 5, x, y, y; 7, x, x, y



(ii) Expression:  $-ab + 2b^2 - 3a^2$   
 Terms:  $-ab, 2b^2, -3a^2$   
 Factors:  $-a, b; 2, b, b; -3, a, a$



20. If  $p = -2$ , find the value of:  
 (i)  $-3p^2 + 4p + 7$  (ii)  $-2p^3 - 3p^2 + 4p + 7$   
 Ans: (i)  $-3p^2 + 4p + 7$

From the question, it is given that  $p = -2$   
 Then, substitute the value of p in the question.  
 $= (-3 \times (-2)^2) + (4 \times (-2)) + 7 = (-3 \times 4) + (-8) + 7$   
 $= -12 - 8 + 7 = -20 + 7 = -13$

(ii)  $-2p^3 - 3p^2 + 4p + 7$   
 From the question, it is given that  $p = -2$   
 Then, substitute the value of p in the question.  
 $= (-2 \times (-2)^3) - (3 \times (-2)^2) + (4 \times (-2)) + 7$   
 $= (-2 \times -8) - (3 \times 4) + (-8) + 7 = 16 - 12 - 8 + 7 = 23 - 20 = 3$

