General Instructions:
1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 10 MCQs carrying 1 mark each
3. Section B has 3 questions carrying 02 marks each.
4. Section C has 2 questions carrying 03 marks each.
5. Section D has 2 questions carrying 05 marks each.
6. Section E has 2 case based integrated units of assessment (04 marks each) with sub- parts
   of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory.

Section – A

1. $\frac{1}{\sqrt{9} - \sqrt{8}}$ is equal to

    (A) $\frac{1}{2}(3 - 2\sqrt{2})$ (B) $\frac{1}{3 + 2\sqrt{2}}$

    (C) $3 - 2\sqrt{2}$ (D) $3 + 2\sqrt{2}$

2. Which of the following is an irrational number?

    (A) $\sqrt{16} - 4$ (B) $(3 - \sqrt{3})(3 + \sqrt{3})$

    (C) $\sqrt{5} + 3$ (D) $-\sqrt{25}$

3. Value of $\frac{1}{\sqrt{18} - \sqrt{32}}$ is equal to

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

4. $(5 + \sqrt{8}) + (3 - \sqrt{2}) - (\sqrt{2} - 6)$ when simplified is
    (A) positive and irrational   (B) negative and irrational
    (C) positive and rational   (D) negative and rational

5. If $\frac{x}{y} + \frac{y}{x} = -1, (x, y \neq 0)$, then the value of $x^3 - y^3$ is
    (A) 1   (B) – 1   (C) 0   (D) ½

6. Degree of the polynomial $(x^3 - 2)(x^2 + 11)$ is
    (A) 0   (B) 2   (C) 5   (D) 2

7. The zeroes of the polynomial $p(x) = (x - 6)(x - 5)$ are
    (A) – 6, – 5   (B) –6, 5   (C) 6, –5   (D) 6, 5

8. If $(x - 3)$ is a factor of $x^3 - 3x^2 + kx - 12$, then value of k is
    (A) – 3   (B) 3   (C) 0   (D) 4

9. The points $(-5, 2)$ and $(2, -5)$ lie in the
    (A) same quadrant   (B) II and III quadrants, respectively
    (C) II and IV quadrants, respectively   (D) IV and II quadrants, respectively

10. If a linear equation has solutions $(-2, 2), (0, 0)$ and $(2, -2)$, then it is of the form
    (A) $y - x = 0$ (B) $x + y = 0$
    (C) $-2x + y = 0$ (D) $-x + 2y = 0$

Section – B
11. Express $1.\overline{32} + 0.\overline{35}$ as a rational number in simplest form

12. Find the product of $[x - \frac{1}{x}], [x + \frac{1}{x}], [x^2 + \frac{1}{x^2}]$ and $[x^4 + \frac{1}{x^4}]$

13. In the figure below, ABCD is a rectangle with length 6 cm and breadth 3 cm. O is the
    mid point of AB. Find the co-ordinates of A, B, C and D.
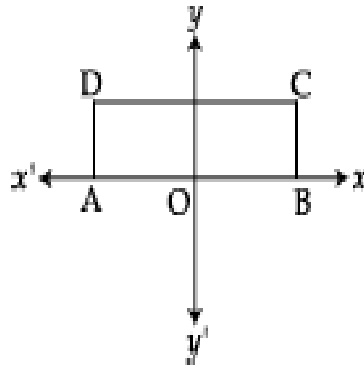
Section – C

14. (i) Simplify $(5a + 3b)^3 - (5a - 3b)^3$
    (ii) Factorise $x^2 - 5x + 4$

15. (i) For what value of c, the linear equation $2x + cy = 8$ has equal values of x and y for its solution
    (ii) If $x = 2k - 1$ and $y = k$ is a solution of the equation $3x - 5y - 7 = 0$, find the value of k

Section – D

16. Find the value of $\left(\dfrac{64}{125}\right)^{-\frac{2}{3}} + \dfrac{1}{\left(\dfrac{256}{625}\right)^{\frac{1}{4}}} + \dfrac{\sqrt{25}}{\sqrt[3]{64}}$
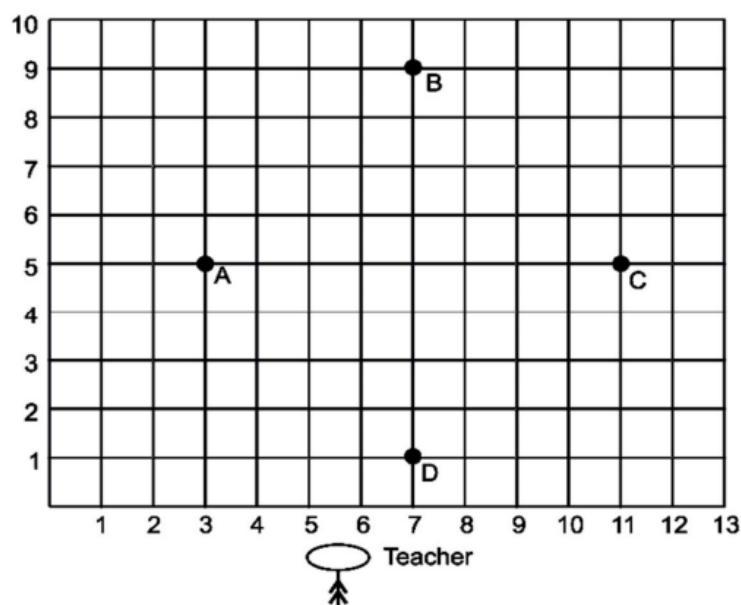
Simplify : $\dfrac{2\sqrt{6}}{\sqrt{2} + \sqrt{3}} + \dfrac{6\sqrt{2}}{\sqrt{6} + \sqrt{3}} - \dfrac{8\sqrt{3}}{\sqrt{6} + \sqrt{2}}$.

17. (i) If $a^2 + b^2 + c^2 = 30$ and $a + b + c = 10$, then find the value of $ab + bc + ca$

Factorise : $27p^3 - \dfrac{1}{216} - \dfrac{9}{2}p^2 + \dfrac{1}{4}p$.

Section – E (Case Based Questions)

18. Students of a school are standing in rows and columns in their playground for a drill practice. A, B, C and D are the positions of four students as shown in the figure.

(a) What are the coordinates of A and B respectively? (1)

(b) What are the coordinates of C and D respectively? (1)

(c) (i) What is the distance between B and D?

   (ii) What are the coordinates of the point of intersection of AC and BD? (2)

19. On his birthday Manoj planned that this time he celebrates his birthday in a small orphanage centre. He bought apples to give to children and adults working there. Manoj gave 2 apples to each child and 3 apples to each adult working there. In all he distributed 60 apples at the centre.

(a) Represent the above situation by a linear equation in two variables taking the number of children as x and the number of adults as y.
(1)

(b) If the number of children is 15, then find the number of adults. (1)

(c) Find four different solutions of the equation obtained in (i) (2)