Time Allowed: 3:00 Hours   **Maximum Marks: 80**

General Instructions:
1. This Question paper contains- five sections A, B, C, D and E. Each section is compulsory.
2. Section A has 18 MCQ's and 02 Assertion -Reason based questions of 1 mark each.
3. Section B has 5 Very short answer type questions of 2 marks each.
4. Section C has 6 Short Answer (SA)-type questions of 3 mark each.
5. Section D has 4 Long Answer (LA)-type questions of 5 mark each.
6. Section E has 3 sources based /case based/passage based/integrated units of assessment (4 marks each) with sub parts.

SECTION - A
(Multiple Choice Questions) Each question carries 1 mark

1. Every rational number is

(A) a natural number   (B) an integer   (C) a real number   (D) a whole number

2. Between two rational numbers
(A) there is no rational number   (B) there are only rational numbers and no irrational number
(C) there is exactly one rational number   (D) there are infinitely many rational numbers

3. Which of the following is irrational?

(A) $\sqrt{7}$ (B) $\sqrt{\frac{8}{2}}$ (C) $\sqrt{\frac{4}{9}}$ (D) $\frac{\sqrt{\frac{1}{2}}}{3}$

4. $2\sqrt{2} + \sqrt{3}$ is equal to

(A) $2\sqrt{6}$ (B) $3\sqrt{3}$ (C) 6   (D) $4\sqrt{6}$

5. $\sqrt{\frac{1}{8}} \times \sqrt{\frac{1}{8}}$ is equal to

(A) $5\sqrt{6}$ (B) $10\sqrt{5}$ (C) $\sqrt{\frac{2}{3}}$ (D) $6\sqrt{5}$

6. Which one of the following is a polynomial?

(A) $\dfrac{x^2}{2} - \dfrac{2}{x^2}$ (B) $\sqrt{x} - 1$ (C) $x^2 + \dfrac{3}{x}$ (D) $\dfrac{x-1}{x+1}$

7. If $p(x) = x + 3$, then $p(x) + p(-x)$ is equal to
(A) 3   (B) 2x   (C) 0   (D) 6

8. If $a + b + c = 0$, then $a^3 + b^3 + c^3$ is equal to
(A) 3abc   (B) abc   (C) 0   (D) 2abc

9. Signs of the abscissa and ordinate of a point in the second quadrant are respecively
(A) $(+, +)$
(B) $(–, –)$
(C) $(–, +)$
(D) $(+, –)$

10. The point at which the two coordinate axes meet is called the
(A) ordinate
(B) origin
(C) abscissa
(D) quadrant

11. If the coordinates of the two points are P $(–2, 3)$ and Q$(–3, 5)$, then (abscissa of P) – (abscissa of Q) is
(A) – 5
(B) 1
(C) – 1
(D) – 2

12. The equation x = 7 in two variables, can be written as
(A) $1. x + 0. y = 7$
(B) $1 . x + 1 . y = 7$
(C) $0 . x + 1 . y = 7$
(D) $0 . x + 0 . y = 7$

13. The linear equation $3x + 4y = 9$ has
(A) A unique solution
(B) Two solutions
(C) Infinitely many solutions
(D) No solution

14. For the following statements correct order of true (T) and false(F) is
(i) Only one line can pass through a single point.
(ii) There are an infinite number of lines which pass through two distinct points.
(iii) A terminated line can be produced indefinitely on both the sides.
(iv) If two circles are equal, then their radii are equal.
(A) (i) T (ii) F (iii) T (iv) T
(B) (i) F (ii) F (iii) T (iv)F
(C) (i) F (ii) F (iii) F (iv) T
(D)(i) F (ii) F (iii) T (iv) T

15. Which of the following is not Euclid's axiom
(A) The whole is greater than the part.
(B) If equals are added to equals, the wholes are equal.
(C) Things which coincide with one another are not equal to one another
(D) If equals are subtracted from equals, the remainders are equal.

16. An angle which is greater than 180° but less than 360° is called a
(A) reflex angle
(B) complementary angles
(C) supplementary angles
(D) obtuse angle

17. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2 : 3, then the greater of the two angles is
(A) 54°
(B) 108°
(C) 120°
(D) 136°

18. In the given diagram measures of angles I, II, III are
respectively (A) 120°, 60°, 90°
(B) 120°, 60°, 90°
(C) 120°, 60°, 90°
(D) 60°, 120°, 60°
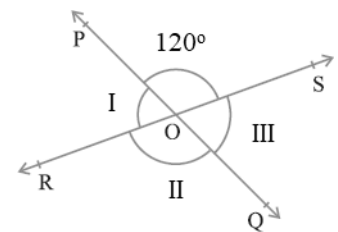
ASSERTION-REASON BASED QUESTIONS
In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(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.

19. **Assertion(A):** Point A $(-2, -4)$ lies on III quadrant

  Reason(R) : A point both of whose coordinates are –ve lies in III quadrant.

20. **Assertion(A):** degree of non zero constant polynomial is zero

  Reason(R) : polynomial having two terms are called binomial.

SECTION –B
[This section comprises of very short answer type questions (VSA) of 2 marks each]

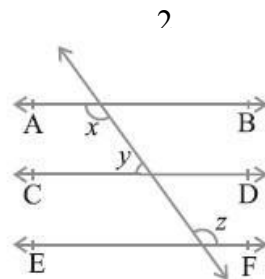21. Find five rational numbers between $3 \dfrac{4}{5}$ and $\dfrac{5}{5}$.

22. Use the Factor Theorem to determine whether $x + 1$ is a factor of $2x^3 + x^2 - 2x - 1$ or not.

23. Find four different solutions of the equation $x + 2y = 6$.

24. If a point C lies between two points A and B such that AC = BC, then prove that $AC = \dfrac{1}{2} AB$. Explain by

drawing the figure.

25. In the given figure, if AB || CD, CD || EF and y : z = 3 : 7, find x.
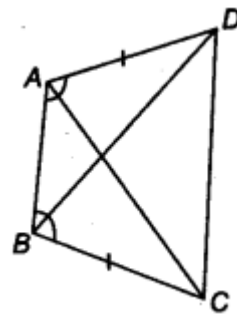

SECTION – C
[This section comprises of short answer type questions (SA) of 3 marks each]

26. (i) $12x^2 - 7x + 1$ (ii) Evaluate 105×106 without multiplying directly.

27. Factorise : $8x^3 + 27y^3 + 36x^2y + 54xy^2$

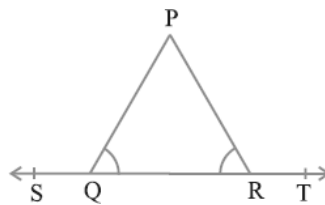28. ABCD is a quadrilateral in which AD = BC and ∠ DAB = ∠ CBA (see figure).
   Prove that

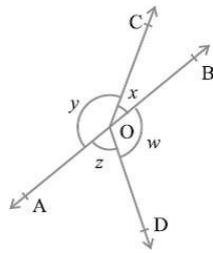29. In the given figure, if AC = BD, then prove that AB = CD.

30. In the given figure, ∠ PQR = ∠ PRQ, then prove that

∠ PQS = ∠ PRT.

31. In the given figure, if x + y = w + z, then prove that AOB is a line.
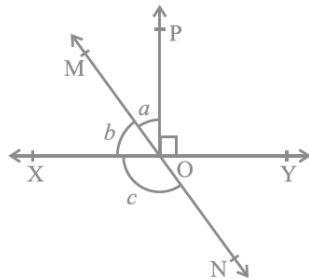

SECTION –D

[This section comprises of long answer type questions (LA) of 5 marks each]

32.(i) Simplify : $2\sqrt{\frac{2}{3}} + 3\sqrt{\frac{2}{3}} + \frac{1}{\sqrt{3}}$

(ii) Find the value of a if

$$\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a - 6\sqrt{3}$$

33. Evaluate each of the following using suitable identities: (i) $(104)^3$ (ii) $(999)^3$
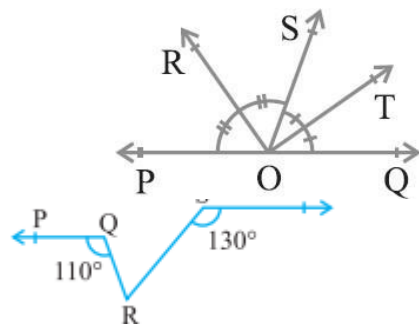

34. n the given figure, lines XY and MN intersect at O. If ∠ POY = 90° and a : b = 2 : 3, find c.

35.   In the given figure, ray OS stands on a line POQ. Ray OR and ray OT are angle bisectors of ∠ POS and ∠ SOQ, respectively.

If ∠ POS = x, find ∠ ROT.

OR

In Fig. if PQ ∥ ST, ∠ PQR = 110° and ∠ RST = 130°, find ∠ QRS.


Section –E

[This section comprises of 3 case- study/passage based questions of 4 marks each with sub parts. The first two case study questions have three sub parts (i), (ii), (iii) of marks 1,1,2 respectively.

36.   On one day, principal of a particular school visited the classroom. Class teacher was teaching the concept of polynomial to students. He was very much impressed by her way of teaching. To check, whether the students also understand the concept taught by her or not, he asked various questions to students. Some of them are given below. Answer them.

(i) The polynomial of the type $ax^2 + bx + c$, $a = 0$ is called
(ii) The value of k, if $(x - 1)$ is a factor of $4x^3 + 3x^2 - 4x + k$, is
(iii)   Expand $(4a - 2b - 3c)^2$.

37.   Observe the graph and answer the questions given below :
(i) What are the coordinates of the points R and M?
(ii) What are the coordinates of the points P and Q?
(iii) What is the total length of $(MP + PN + RQ + QS)$?
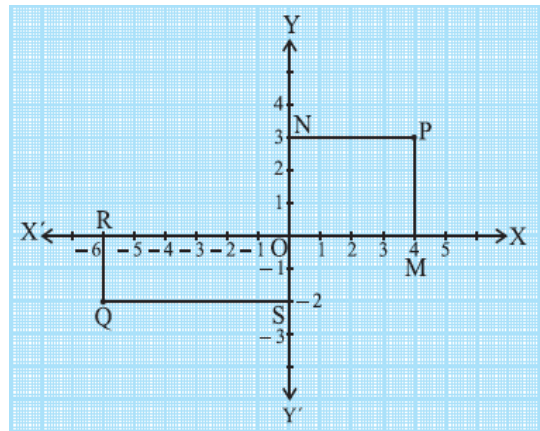
38.   .In the given figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR.
On the basis of the given information and given diagram answer the following

(i) What is the measure of $\angle POS + \angle SOR$?

(ii) Name the acute angles in this diagram.

(iii) Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$.

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