VMC Vidyamandir Classes SINCE 1986
IIT JEE | MEDICAL | FOUNDATION

MOCK MATHEMATICS SUBJECTIVE TEST
CLASS – IX (SET – 1)

Maximum Marks: 80 **Duration 3.0 Hours**

Number System, Polynomials, Coordinate Geometry, Euclid's Geometry, Lines & Angles, Triangles, Heron's Formula, Linear Equation in Two Variables

General Instructions:

1. This question paper consists of **38 questions**. All questions are compulsory.
2. **Paper Pattern and Marking Scheme:**
   There are **Five Sections** in the question paper (Section **A**, **B**, **C**, **D** and **E**).
   - In **Section A** – question numbers **1 to 20** are Multiple Choice Questions (MCQs) carrying **1** mark each.
   - In **Section B** – question numbers **21 to 25** are Very Short Answer Questions (VSA) type carrying **2** marks each.
   - In **Section C** – question numbers **26 to 31** are Short Answer Questions (SA) type carrying **3** marks each.
   - In **Section D** – question numbers **32 to 35** are Long Answer Questions (LA) type carrying **5** marks each.
   - In **Section E** – question numbers **36 to 38** are 3 source-based/case-based units of assessment carrying 4 marks each with sub-parts.
   - There is no overall choice. However, an internal choice has been provided in some Sections.

(SECTION – A)

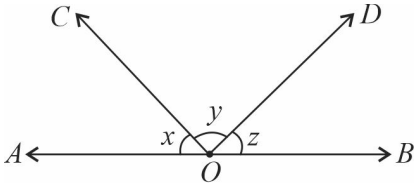
1. Which one of the following is a polynomial?

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

2. The sides of a triangle are 56 cm, 60 cm and 52 cm long. Then the area of the triangle is:

(A) $1322\ cm^2$ **(B)** $1311\ cm^2$ **(C)** $1344\ cm^2$ **(D)** $1392\ cm^2$

3. In the following figure, AOB is a straight line. If $x:y:z=4:5:6$, then $y=?$



(A) 60° **(B)** 48° **(C)** 80° **(D)** 72°

4. Two points having same ordinate but different abscissa lie on:

(A) x-axis **(B)** a line parallel to y-axis

(C) y-axis **(D)** a line parallel to x-axis

5. The factorization of $4x^2+8x+3$ is:

(A) $(x+1)(x+3)$ **(B)** $(2x+1)(2x+3)$ **(C)** $(2x+2)(2x+5)$ **(D)** $(2x-1)(2x-3)$

6. Which of the following is irrational?

(A) 0.14 **(B)** $0.14\overline{16}$ **(C)** $0.\overline{1416}$ **(D)** 0.4014001400014…

7. If $p<0$ and $q<0$, then the point $(-p^{103},-q^{102})$ lies in _____ quadrant:

(A) First **(B)** Second **(C)** Third **(D)** Fourth

8. $12^{1/4}\times 3^{1/4}\div 3^{1/2}$ is equal to:

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

9. If $AB=XY$ and $XY=PQ$, then the correct option is:

(A) $AB=2PQ$ **(B)** $AB<PQ$ **(C)** $AB=PQ$ **(D)** $AB>PQ$

10. In ΔPQR, S is mid point of PR such that $QS=\frac{1}{2}PR$. Then, $\angle PQR$ is equal to:

(A) 90° **(B)** 45° **(C)** 60° **(D)** 180°

11. It is given that $\Delta ABC\cong\Delta FDE$, $AB=4cm$, $\angle A=30°$ and $\angle B=80°$. Then, which of the following is true?

(A) $\angle F=70°$, $DE=4cm$ **(B)** $\angle E=70°$, $DE=4cm$

(C) $\angle E=70°$, $DF=4cm$ **(D)** $\angle D=70°$, $EF=4cm$

12. A square and an equilateral triangle have the same perimeter. If the diagonal of the square is $12\sqrt{2}$ units, then the area of the triangle (in square units) is:

(A) $24\sqrt{2}$ **(B)** $24\sqrt{3}$ **(C)** $48\sqrt{3}$ **(D)** $64\sqrt{3}$

13. If $3^{48}+3^{48}+3^{48}=3^x$, then $\sqrt{x}$ is:

(A) 8 **(B)** 13 **(C)** 3 **(D)** 7

14. The solution of linear equation, $y=3x$ is:

(A) $\left(\frac{3}{2},\frac{-3}{2}\right)$ **(B)** $\left(\frac{1}{2},\frac{-3}{2}\right)$ **(C)** $\left(\frac{1}{2},\frac{3}{2}\right)$ **(D)** $\left(\frac{3}{2},\frac{1}{2}\right)$

15. The supplementary angle of $(43-2x)°$ is:

(A) $(2x-137)°$ **(B)** $(2x+137)°$ **(C)** $(2x+147)°$ **(D)** $(3x+137)°$

16. If the base of an isosceles triangle is 6 cm and each of its equal sides is 5 cm, then shortest altitude of the triangle is:

(A) 6 cm **(B)** 5 cm **(C)** 3 cm **(D)** 4 cm

17. The value of $'p'$ such that $(3x-5)$ divides the polynomial $q(x)=3x^2+px-10$ is:

(A) 2 **(B)** -1 **(C)** 1 **(D)** 4

18. In Indus valley civilization (about 300 B.C.) the bricks used for construction work were having dimensions in the ratio:

(A) 1 : 3 : 4 **(B)** 4 : 2 : 1 **(C)** 4 : 4 : 1 **(D)** 4 : 3 : 2

Direction: In the question number 19 and 20, a statement of Assertion **(A)** is followed by a statement of Reason **(R)**. Choose the correct option:

(A) Both A and R are true and R is the correct explanation for A

(B) Both A and R are true but R is not the correct explanation for A

(C) A is true but R is false

(D) A is false but R is true

19. **Assertion (A) :** $\sqrt{5}$ is an irrational number.

Reason (R) : Every integer is a rational number.

20. **Assertion (A) :** If $(x-2)$ is a factor of $f(x)=2x^2+3x-k$, then value of $k=14$.

Reason (R) : $(x-a)$ is a factor of polynomial $f(x)$, if $f(a)=0$.

(SECTION – B)

21. State any two Euclid's postulate.

22. Find two integer solutions of the equation $2x+3y=12$.

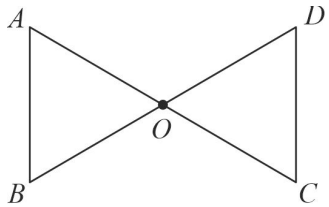
OR

If the point $(2k-3,\ k+2)$ lies on the straight line $2x+3y+15=0$, find value of k.

23. If PM and RN are perpendiculars on the diagonal QS of a parallelogram $PQRS$. Prove that $\Delta PMS \cong \Delta RNQ$.

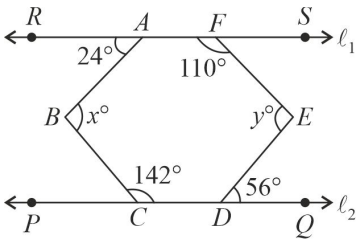
OR

In the given figure, O is the mid-point of AC and BD. Prove that $AB \parallel DC$.



24. Simplify $\left(x^{1/3}-y^{5/3}\right)\left(x^{2/3}+y^{10/3}+x^{1/3}y^{5/3}\right)$.

25. In the given figure, if lines $l_1 \| l_2$, then find the value of x and y.



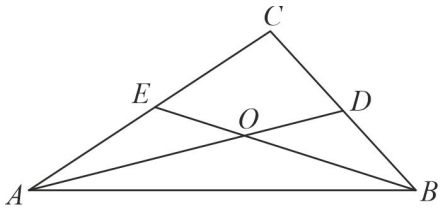
(SECTION – C)

26. An umbrella is made by stitching ten triangular pieces of cloth, each measuring 60 cm, 60 cm and 20 cm. Find the area of the cloth required for the umbrella. (Given : $\sqrt{35} = 5.92$)

OR

An equilateral triangle is cut along its altitude. If the perimeter of each triangle obtained after cutting the original triangle is $9\left(\sqrt{3}+1\right)cm$, find the area of the whole triangle. (given $\sqrt{3} = 1.73$)

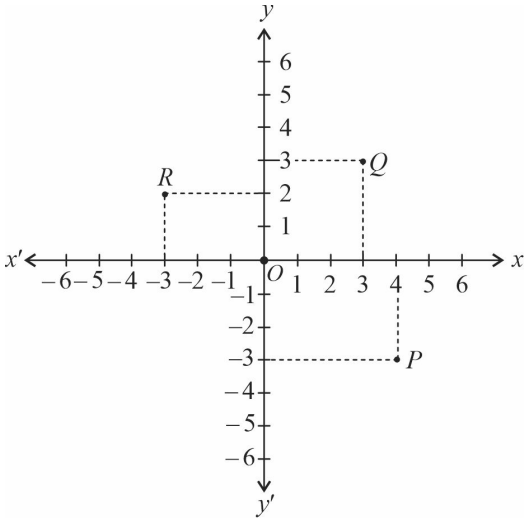
27. In the given figure, $\angle CAB = \angle CBA$, D and E are points on the sides BC and AC respectively of ΔABC such that $BD = AE$. If O is the point of intersection of AD and BE, then prove that $OA = OB$.



28. If $a+b=12$ and $a^2+b^2=74$, then find the value of a^3+b^3.

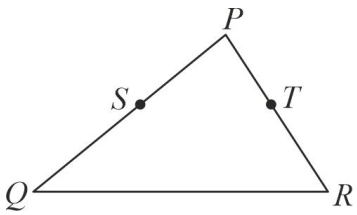
29. In the given figure,

(i) Find the coordinates of P, Q and R.



(ii) Find the value of (abscissa of Q) – (ordinate of R).

30. In the given figure, if $PS = \frac{1}{2}PQ$, $PT = \frac{1}{2}PR$ and $PS = PT$, then using Euclid's axioms show that $PQ = PR$.



OR

Write Euclid's axioms.

31. Solve $\frac{1}{\sqrt{5}+\sqrt{3}-\sqrt{8}}$ using rationalizing the denominator.

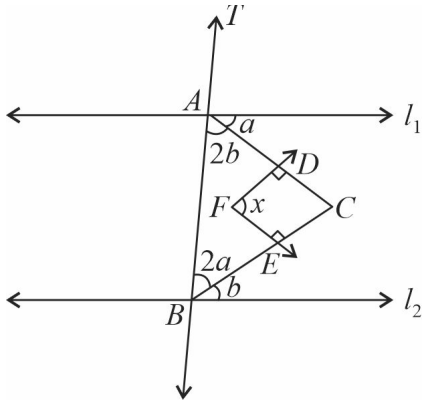
(SECTION – D)

32. If $a = \frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}$ and $b = \frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$, then find the value of $\frac{a^2+ab+b^2}{a^2-ab+b^2}$.

OR

If $\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = a + \frac{7\sqrt{5}}{11}b$, then find the values of a and b.

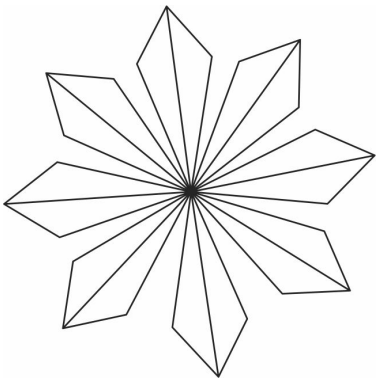
33. In the given figure, if the lines $\ell_1 \| \ell_2$, then find the value of $\left(\frac{a+b}{x}\right)$.



34. If D is the mid-point of hypotenuse AC of right angled ΔABC in which $\angle B = 90°$, then prove that $BD = \frac{1}{2}AC$.

OR

A floral design on a floor is made up of 16 triangular tiles, each having sides 9 cm, 28 cm and 35 cm. Find the cost of polishing the tiles at the rate of Rs. 2.50 per cm^2 [Take $\sqrt{6} = 2.45$]



35. Factorize:

(i) $27x^3 + 125y^3 + 135x^2y + 225xy^2$

(ii) $a^3 - 8b^3 - 64c^3 - 24abc$

(SECTION – E)

36. The parabolic shape of the cables along suspension bridges help carry the forces on the bridges to the top of the towers, it is represented by $p(x) = ax^2 + bx + c$ (where $a, b, c \neq 0$)

(i) The type of polynomial $p(x)$ on the basis of degree is_____ **(1)**

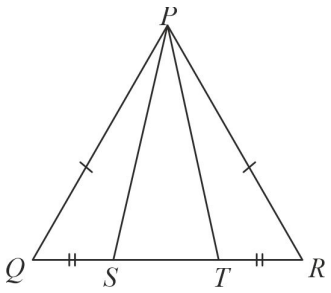
(ii) The type of polynomial $p(x)$ on the basis of number of terms is _____ **(1)**

(iii) If the cable of suspension bridge is represented by $p(x) = x^2 + x - 6$, then find its zeroes. **(2)**

OR

The cable of suspension bridge is represented by $p(x) = x^2 + kx + 3$. If 3 is one of the zeroes of the polynomial $p(x)$, then find the value of k. **(2)**

37. A children's park is in the shape of an isosceles triangle say PQR with $PQ = PR$, S and T are points on QR such that $QT = RS$.



(i) Which rule is applied to prove the congruency of ΔPQS and ΔPRT ? **(1)**

(ii) If $PQ = 6$ cm and $QR = 7$ cm, then find perimeter of ΔPQR . **(1)**

(iii) What type of triangle is ΔPST ? **(2)**

OR

If $\angle QPR = 80°$, find $\angle PQR$. **(2)**

38. A three wheeler scooter charges ₹18 for first kilometer and ₹12 each for every subsequent kilometer. If Ravi covers a distance of x km, he pays an amount of ₹ y.

(i) Write the linear equation representing the above equation. **(1)**

(ii) Write two solutions for the linear equation formed. **(1)**

(iii) If per kilometer charge is increased by ₹3 and the first kilometer charge by ₹5, then find the difference in the billing amount to cover a distance of 20 kilometers. **(2)**

OR

If Ravi covers a certain distance in three-wheeler scooter and paid ₹126 as a bill, then find the distance (in km) covered by him. **(2)**