J M International School

HALF YEARLY EXAMINATION (2017-18)
SUBJECT : MATHEMATICS
CLASS : IX

Name : ....

Roll No: ....

DATE : ....

MM : 80

GENERAL INSTRUCTIONS:
1. All questions are compulsory.
2. The question paper consists of five sections.
   Section A contains 7 questions of 1 mark each.
   Section B contains 5 questions of 2 marks each.
   Section C contains 9 questions of 3 marks each.
   Section D contains 4 questions of 4 marks each.
   Section E contains 4 questions of 5 marks each.

SECTION – A
(1 × 7 = 7)

Q No. 1 to 7 carry 1 mark each:

1. Find two rational numbers in the form $\frac{p}{q}$ between 0.343443444344443.......
   and 0.363663666366663.......
2. Write the distance of point A(3, 5) from x-axis.
3. Write the general form of Linear Equation in two variables. How many solution / solutions it can have and what type of graph it can represent .
4. Write two Euclid's Axioms.
5. Two adjacent angles are equal. Is it necessary that each of these angles will be a right angle? Justify your answer.
6. Prove that in a right triangle, hypotenuse is the longest (or largest) side.
7. Can the angles 110^0, 80^0, 70^0 and , 95^0 be the angles of a quadrilateral ? Why or why not?

SECTION – B
(2 × 5 = 10)

Q No. 8 to 12 carry 2 marks each:

8. Find the value of 'a' for which (x - a) is a factor of the polynomial
   $p(x) = x^5 - a^2x^3 + 2x + a - 3$
9. Represent $\sqrt{17}$ on the number line.
10. Write coordinates of a point which is the reflection of (-1, 2) along x - axis. Also, write coordinates of a point which is the reflection of (1,-2) along y - axis.
11. Sum of two angles of a triangle is 90^0 and their difference is 50^0. Find all the angles of the triangle.
12. In the figure, If AC= BD, then prove that AB= CD.

SECTION – C $(3 \times 9 = 27)$
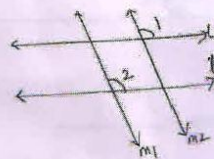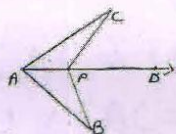
Q No. 13 to 21 carry 3 marks each:

13. (i) If the angles of a triangle are in the ratio $2 : 3 : 5$, then find the angles of the triangle.

(ii) In the adjoining figure $l_1 \parallel l_2$ and $m_1 \parallel m_2$. If $\angle 1 = 115^0$, find $\angle 2$

14. In the given figure, $\angle CPD = \angle BPD$ and AD is the bisector of $\angle BAC$. Prove that $\triangle BAP \cong \triangle CAP$ and hence BP = CP.

15. In the adjoining figure, line l is the bisector of an angle $\angle A$ and B is any point on l. BP and BQ are perpendiculars from B to the arms of $\angle A$. Show that (i) $\triangle APB \cong \triangle AQB$ and (ii) BP = BQ.
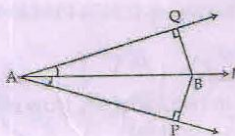
16. Two parallel lines l and m are intersected by a transversal p. Show that the quadrilateral formed by the bisectors of interior angles is a rectangle.
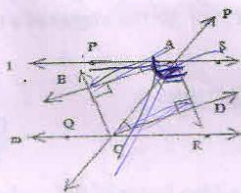
17. Express $2.\overline{57}$ in the form of $\frac{p}{q}$ where p and q are integers and $q \neq 0$.

18. Factorise $x^3 - 23 x^2 + 142x - 120$.

19. Three vertices of rectangle are (3, 2), (- 4, 2) and (- 4, 5). Plot these points and find the co-ordinates of the fourth vertex.

20. Give the geometrical representation of $2x - 5 = 0$ as an equation

    (i) in one variable

    (ii) In two variables

21. (i) Explain Euclid's fifth postulate with the help of figure.

    (ii) Write the rationalising factor of the denominator in $\frac{1}{\sqrt{7} + \sqrt{5}}$.

SECTION – D
(4 × 4 = 16)

QNo 22 to 25 carry 4 marks each:

22) In the figure DE || QR, AP and BP are bisectors of ∠ EAB and ∠ RBA respectively find ∠ APB .
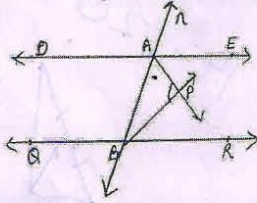
23. Δ ABC is an isosceles triangle in which AB = AC, side BA is produced to D such that AD = AB. Show that ∠ BCD is a right angle.

24. Prove that the figure formed by joining the mid – points of the pairs of consecutive sides of a quadrilateral is a parallelogram .

25. Visualise $5.\overline{49}$ on the number line , up to 4 decimal places .

SECTION – E
(4 × 5 = 20)

Q No. 26 to 29 carry 5 marks each:

26. (i) Factorise: $(p-q)^3 + (q-r)^3 + (r-p)^3$

(ii) If $a + b + c = 7$ and $ab + bc + ca = 20$, then find the value of $a^2 + b^2 + c^2$.

27. Draw the graphs of the equations $x - 2y - 3 = 0$ and $4x + 3y -1 = 0$ on the same graph . Also find the coordinates of the point where they intersect.

28. State and prove Mid – point Theorem.

29. (i) Show that the diagonals of a rhombus are perpendicular to each other .

(ii) Prove that a diagonal of a parallelogram divides it into two congruent triangles .