Roll Number		

SET C

INDIAN SCHOOL MUSCAT
HALF YEARLY EXAMINATION
MATHEMATICS

CLASS: IX Sub. Code: 041 Time Allotted: 3 Hrs

23.09.2019 Max. Marks: 80

General Instructions:

1. All questions are **compulsory**.
2. The question paper consists of **40** questions divided into **four sections A, B, C and D**. **Section-A** comprises **20** questions of **1 mark** each; **Section-B** comprises **6** questions of **2 marks** each; **Section-C** comprises **8** questions of **3 marks** each and **Section-D** comprises 6 questions of **4 marks** each.
3. There is no overall choice. However, an internal choice has been provided in two questions of 2 marks each, three questions of 3 marks each and two questions of 4 marks each. You have to attempt only one of the questions in all such questions.
4. Use of calculator is not permitted.

SECTION – A (20 × 1 = 20)

I Multiple Choice Questions.
Choose the correct answer and write the answer with the option given.

1. An exterior angle of a triangle is 105° and one of its interior opposite angles is 48°, then the other interior opposite angle is
(a) 42° (b) 53° (c) 47° (d) 57°

2. Which of the following expressions is a polynomial in one variable?
(a) $\sqrt{y} - 3$ (b) $\frac{1}{x} + x + 2$ (c) $\sqrt{2}x^2 - 3x + 6$ (d) $x^2 + 6y + 10$

3. 50% of an angle is the supplement of 120°. The measure of the angle is :
(a) 60° (b) 100° (c) 120° (d) 30°

4. The coefficient of the highest power of x in the polynomial $2x^3 - 4x^4 + 5x^2 - x^5 + 3$ is
(a) 2 (b) -4 (c) 1 (d) -1

5. The value of $x^{a-b} \times x^{b-c} \times x^{c-a}$ is
(a) 0 (b) 1 (c) 2 (d) x

6. The graph of y = - 1 is parallel to :
(a) x-axis (b) y-axis (c) x = y (d) neither x-axis nor y-axis

7. Which of the points A (0, 6), B (-2, 0), C (0, -5), D (3, 0) and E (1, 2) lie on x-axis?
(a) A and C (b) B and D (c) A, C and E (d) E only

8. An irrational number between 0.3101 and 0.333.... is
(a) 0.32010010001.... (b) 0. 1010010001... (c) 0. 3201 (d) 1. 323232.....

9. In ΔABC and ΔPQR, if AB=QR, BC=PR and CA=PQ, then
(a) ΔABC≅ΔPQR (b) ΔCBA≅ΔPRQ (c) ΔBAC≅ΔRPQ (d) ΔPQR≅ΔBCA

10. Abscissa of a point is positive in
(a) quadrant I only (b) quadrant II only (c) quadrants I and II (d) quadrants I and IV

II Answer the following questions:

11. Find the mirror image of the point (-4, 5) with respect to y-axis.

12. Evaluate using suitable identity: 103 × 97

13. Simplify: $(27)^{\frac{-1}{3}}$

14. In ΔABC, ∠A =70° and AB = AC, then find ∠B.

15. A wheel has six spokes equally spaced. What is the angle between two adjacent spokes?

16. If (2, -3) is a solution of the equation 2y = ax +4, then find the value of a.

17. In fig.1, ∠AOC +∠COD=100° and ∠BOD+∠COD=146°, find ∠COD.

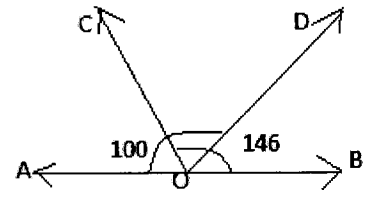


Fig.1

18. Given that $\sqrt{10}$ = 3.162, find the value of $\frac{1}{\sqrt{10}}$

19. In ΔPQR, ∠P = 100° and ∠R = 50°. Which side of the triangle is the longest? Give reason(s) for your answer.

20. If x - 2 is a factor of polynomial $2x^2 + 3x - p$, then find the value of p.

SECTION – B (6 × 2= 12)

21 If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2 : 3, then find the smaller of the two angles.

(OR)

The angles of a triangle are (x+10)°, (x+40)° and (2x – 30)°. Find the value of x and mention the type of triangle according to sides.

22. Expand using suitable identity: $(3a - 2b + 5c)^2$

(OR)

If $x + y + z = 9$ and $xy + yz + zx = 23$ then find the value of $(x^2 + y^2 + z^2)$.

23. Find the coordinates of the point which lies on **(i)** x and y axes both.

(ii) x-axis at a distance of 5 units from the y-axis to its left.

24. Frame a linear equation in the form $ax + by + c = 0$ by using the given values of a, b and c.
(i) $a = -2, b = 5, c = 1$ (ii) $a = 3, b = 0, c = -8$

25. Express $2.3\overline{7}$ as a rational number.

26. Show that in a right angled triangle, the hypotenuse is the longest side.

SECTION – C (8 x 3= 24)

27. Represent $\sqrt{3}$ on the number line.

(OR)

Represent $\sqrt{6.3}$ on the number line.

28. Classify the following numbers as rational or irrational:
a) $-\sqrt{0.4}$ b) $\frac{\sqrt{12}}{\sqrt{3}}$ c) $(1 + 2\sqrt{5}) - (4 + \sqrt{5})$ d) $\frac{3}{11}$ e) $(\sqrt{5} - 3)^2$ f) 0.7356

29. If the polynomials $a x^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when divided by $x - 3$, find the value of a.

(OR)

If $a + b + c = 5$ and $ab + bc + ca = 10$ then find the value of $a^3 + b^3 + c^3 - 3abc$

30. Two line segments AB and CD intersect each other at O such that AO = OB and CO = OD.

Prove that AC = BD.

(OR)

In fig.2, ∠CAB : ∠BAD = 1: 2, find all the interior angles of ΔABC

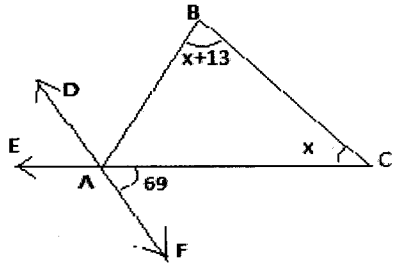


fig.2

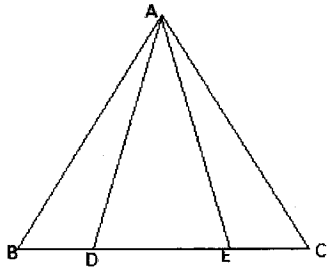


Fig.3

31. In fig3, an isosceles triangle ABC with AB=AC, D and E are points on BC such that BE=CD. Show that AD=AE.

32. Prove that angles opposite to equal sides of an isosceles triangle are equal.

33. One number is three times the other number. Write a linear equation in two variables to represent this statement. Also find three solutions of the equation.

34. Factorize: (i)) $\frac{64}{27}z^3 - 1 - \frac{16}{3}z^2 + 4z$ (ii) $216\,a^3 - 2\sqrt{2}\,b^3$

SECTION – D (6 × 4 = 24)

35. If $a + b\sqrt{5} = \frac{\sqrt{5}-1}{\sqrt{5}+1} - \frac{\sqrt{5}+1}{\sqrt{5}-1}$, find the values of a and b.

36. Factorize: $x^3 + 4x^2 + x - 6$

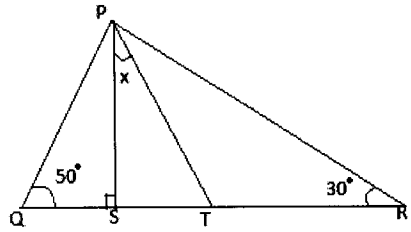
37. Draw the graph of the equation $3x - 2y = 6$. Check from the graph whether the point (3, -2) lies on the graph or not.

38. The sides AB and AC of ΔABC are produced to points E and D respectively. If bisectors BO and CO of ∠CBE and ∠BCD respectively meet at point O, then prove that ∠BOC = 90° - ½ ∠BAC.

(OR)

In fig.4, PT is the bisector of ∠QPR in ΔPQR and PS⊥QR. Find the value of x. (Show the working)

Fig.4



39. In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM=CM. Point D is joined to point B.

Show that (i) ΔAMC≅ΔBMD (ii) ∠DBC =90°

(OR)

ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC. If AD is extended to intersect BC at P, show that

(i) ΔABD ≅ ΔACD

(ii) ΔABP ≅ ΔACP.

40. Plot the points A (-3, 0), B (3, 0), C (2, 3) and D (-2, 3) on a graph. Join these points in the given order. Name the figure so obtained and also find its area.

End of the Question Paper