DON BOSCO SCHOOL, ALAKNANDA, NEW DELHI – 110019

CLASS 9 – PRACTICE PAPER (MATHEMATICS)

Time: 3 Hrs | M.M: 80

General Instructions:

1. This question paper contains 38 questions.

2. It is divided into FIVE sections – Section A, B, C, D and E.

3. Section A consists of 18 multiple choice questions and 2 assertion-based questions of 1 mark each.

4. Section B consists of 5 questions of 2 marks each.

5. Section C consists of 6 questions of 3 marks each.

6. Section D consists of 4 questions of 5 marks each.

7. Section E consists of 3 case-based questions of 4 marks each.

SECTION A (MCQ): 20 × 1 = 20 marks

Q1. The decimal expansion of 7/16 will terminate after: (A) 1 decimal place (B) 2 decimal places (C) 3 decimal places (D) 4 decimal places

Q2. Which of the following is irrational? (A) $\sqrt{49}$ (B) $\sqrt{75}/\sqrt{3}$ (C) 2.131313... (D) 0.1010010001...

Q3. The coefficient of x^3 in $(x^2 - 2x)(x + 3)$ is: (A) -2 (B) 3 (C) 1 (D) -6

Q4. Degree of the polynomial $7x^4 - 5x^3 + 9$ is: (A) 3 (B) 4 (C) 5 (D) None

Q5. If $f(x) = x^2 + 2x - 3$, then $f(2) + f(-2)$ = (A) 0 (B) -4 (C) 8 (D) 12

Q6. If $x + y = 8$ and $xy = 12$, then $x^2 + y^2$ = (A) 28 (B) 40 (C) 52 (D) 64

Q7. The abscissa of a point is positive in: (A) Quadrants I & II (B) Quadrants I & IV (C) Quadrants II & III (D) Quadrants III & IV

Q8. The distance of the point (0, -7) from the x-axis is: (A) 0 (B) 7 (C) -7 (D) None

Q9. The point (3,0) lies on: (A) x-axis (B) y-axis (C) origin (D) none

Q10. The equation of x-axis is: (A) x = 0 (B) y = 0 (C) x + y = 0 (D) y = x

Q11. Which of the following is a solution of 2x + 3y = 12? (A) (2,2) (B) (3,2) (C) (0,4) (D) (4,0)

Q12. Parallel lines have: (A) No common point (B) Exactly one common point (C) Two common points (D) Infinitely many common points

Q13. A line intersecting two or more lines at distinct points is called: (A) Parallel line (B) Transversal (C) Secant (D) None

Q14. If 2^x × 4^(x-1) = 32, then x = (A) 1 (B) 2 (C) 3 (D) 4

Q15. If one angle of a triangle is 90° and another is 45°, the third angle is: (A) 30° (B) 35° (C) 45° (D) 60°

Q16. In a ΔABC, ∠A = 40°, ∠B = 60°. ∠C = ? (A) 70° (B) 80° (C) 100° (D) 120°

Q17. The perimeter of an equilateral triangle with side 15 cm is: (A) 30 cm (B) 45 cm (C) 60 cm (D) 75 cm

Q18. Semi-perimeter of a triangle with sides 10 cm, 24 cm, 26 cm is: (A) 30 cm (B) 40 cm (C) 60 cm (D) 80 cm

Q19. Assertion (A): Every rational number can be expressed in the form p/q, q ≠ 0. Reason (R): Rational numbers are always integers. (A) Both A and R true, R explains A (B) Both A and R true, R does not explain A (C) A true, R false (D) A false, R true

Q20. Assertion (A): Vertically opposite angles are equal. Reason (R): If a transversal intersects two parallel lines, alternate interior angles are equal. (A) Both A and R true, R explains A (B) Both A and R true, R does not explain A (C) A true, R false (D) A false, R true

SECTION B (5 × 2 = 10 marks)

Q21. Find the zeroes of the polynomial $x^2 - 7x + 10$.

Q22. Rationalise $5/(\sqrt{7} - \sqrt{5})$.

Q23. Write the equation of a line passing through (2,3) and parallel to the y-axis.

Q24. Define and explain Euclid's first postulate.

Q25. Find the area of a triangle with base 12 cm and height 9 cm.

SECTION C (6 × 3 = 18 marks)

Q26. Express 0.272727... as a rational number.

Q27. Factorise: $x^2 - 6x + 8$.

Q28. Find three solutions of the equation $2x + y = 6$.

Q29. In the given figure, $\angle ABC = 90°$, AB = 8 cm, BC = 15 cm. Find AC.

Q30. Prove: Sum of the angles of a triangle is 180°.

Q31. Find the area of a triangle whose sides are 13 cm, 14 cm and 15 cm.

SECTION D (4 × 5 = 20 marks)

Q32. Simplify: $((\sqrt{3} + \sqrt{2})/(\sqrt{3} - \sqrt{2}))^2$.

Q33. Factorise completely: $x^3 - 6x^2 + 11x - 6$.

Q34. In a triangle, prove that the angle opposite to the longer side is greater.

Q35. A park is in the form of a right triangle with sides 80 m, 60 m, and 100 m. Find its area and the cost of fencing it at ₹25 per metre.

SECTION E (CASE STUDIES: 3 × 4 = 12 marks)

Q36. A farmer has a triangular plot with sides 60 m, 80 m and 100 m.
a) Find the area of the plot. (1)
b) If he grows grass at the cost of ₹3 per m^2, find the total cost. (2)
c) How much fencing is required if the plot is fenced once? (1)

Q37. A rectangular field has length (x + 5) m and breadth (x - 3) m.
a) Write its area as a polynomial. (1)
b) If x = 7, find its area. (1)
c) Find its perimeter in terms of x. (2)

Q38. A light ray strikes a mirror making an angle of 30° with the mirror.
a) Find the angle of incidence. (1)
b) Find the angle of reflection. (1)
c) If the ray is then reflected from another mirror placed perpendicular to the first, show that the final ray is parallel to the incident ray. (2)