TELANGANA STATE – SSC (CLASS 10) MODEL PAPER

MATHEMATICS – Model Paper 1

Class X | Mathematics — Time: 3 Hrs 15 Min | Max. Marks: 80

Instructions: Part A carries 60 marks and Part B (objective) carries 20 marks. Show all steps.

Section I (8 × 2 = 16 marks) Answer all questions.

1. Find the HCF of 96 and 404 using prime factorisation.
2. If A = {1, 2, 3, 4} and B = {3, 4, 5, 6}, find A ∪ B and A ∩ B.
3. Find the zeroes of the polynomial $x^2 - 5x + 6$.
4. Find the discriminant of $2x^2 - 4x + 3 = 0$ and state the nature of its roots.
5. Find the 10th term of the AP 3, 7, 11, …
6. Find the distance between the points (2, 3) and (5, 7).
7. Find the value of sin 30° + cos 60°.
8. A die is thrown once. Find the probability of getting a prime number.

Section II (5 × 4 = 20 marks) Answer all questions.

1. Prove that √5 is an irrational number.
2. Solve by substitution: 2x + 3y = 11 and x − y = −2.
3. Find the sum of the first 20 terms of the AP 5, 8, 11, …
4. Prove that $(1 - \cos^2\theta)(1 + \cot^2\theta) = 1$.
5. Find the mean of the data: x = 10, 20, 30, 40 with frequencies f = 5, 8, 4, 3.

Section III (3 × 8 = 24 marks) Answer all questions.

1. The sum of the squares of two consecutive positive integers is 145. Form a quadratic equation, solve it and find the integers.
2. The angle of elevation of the top of a tower from a point 30 m from its base is 60°. (a) Find the height of the tower (take √3 = 1.73). (b) Find the distance of the point from the top of the tower.
3. A cone has radius 7 cm and slant height 25 cm. Find its height, volume and total surface area (π = 22/7).

Part B – Objective (20 × 1 = 20 marks) Choose the correct answer.

1. LCM of 12 and 18 is
   (a) 24 (b) 36 (c) 72 (d) 6
2. If n(A)=3, n(B)=4, n(A∩B)=1, then n(A∪B) =
   (a) 6 (b) 7 (c) 8 (d) 5
3. Degree of the polynomial $x^3 - 2x + 5$ is
   (a) 1 (b) 2 (c) 3 (d) 5
4. A quadratic polynomial has at most ___ zeroes
   (a) 1 (b) 2 (c) 3 (d) 4
5. The pair x+y=5 and 2x+2y=10 has
   (a) no solution (b) one solution (c) two solutions (d) infinitely many solutions
6. Roots of $x^2 - 9 = 0$ are
   (a) 3 (b) −3 (c) ±3 (d) 9
7. nth term of the AP 2, 4, 6, … is
   (a) n+2 (b) 2n (c) 2n+2 (d) n^2
8. Distance of (3, 4) from the origin is
   (a) 3 (b) 4 (c) 5 (d) 7
9. Mid-point of (2, 4) and (6, 8) is
   (a) (4, 6) (b) (3, 5) (c) (8, 12) (d) (2, 2)
10. Two similar triangles have sides in the ratio 1 : 2. Ratio of their areas is
    (a) 1 : 2 (b) 1 : 4 (c) 2 : 1 (d) 1 : 3
11. A tangent to a circle is perpendicular to the radius at the point of contact. The angle is
    (a) 45° (b) 60° (c) 90° (d) 180°
12. Volume of a cylinder with r = 7 cm, h = 10 cm (π = 22/7) is
    (a) 440 cm^3 (b) 1540 cm^3 (c) 154 cm^3 (d) 1440 cm^3
13. tan 45° =
    (a) 0 (b) 1 (c) √3 (d) 1/√3
14. $\sin^2\theta + \cos^2\theta$ =
    (a) 0 (b) 1 (c) 2 (d) sinθ
15. Probability of an impossible event is
    (a) 1 (b) 0.5 (c) 0 (d) −1

16. Probability of a sure event is
    (a) 0 (b) 1 (c) 1/2 (d) 2
17. Mean of the first five natural numbers is
    (a) 2 (b) 3 (c) 4 (d) 5
18. Median of 3, 5, 7, 9, 11 is
    (a) 5 (b) 9 (c) 7 (d) 11
19. Curved surface area of a sphere of radius r is
    (a) $2\pi r^2$ (b) $4\pi r^2$ (c) πr^2 (d) $(4/3)\pi r^3$
20. Mode of 2, 3, 3, 4, 5, 3, 6 is
    (a) 2 (b) 3 (c) 4 (d) 6

Hints for Part A (Section I & II)
Sec I: 1) 4 2) {1,2,3,4,5,6}, {3,4} 3) 2, 3 4) −8, no real roots 5) 39 6) 5 7) 1 8) 1/2.
Sec II: 10) x=1, y=3 11) 670 13) 22.5. Sec III: 14) 8 and 9 15) 51.9 m; 60 m 16) h=24 cm, V=1232 cm^3, TSA=704 cm^2.

Answer Key – Part B
1-b 2-a 3-c 4-b 5-d 6-c 7-b 8-c 9-a 10-b 11-c 12-b 13-b 14-b 15-c 16-b 17-b 18-c 19-b 20-b

Original practice paper prepared in the SCERT Telangana SSC pattern. Not an official Board paper.