

**KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION**  
**SAMPLE PAPER 02 FOR PERIODIC TEST II EXAM (2017-18)**

SUBJECT: MATHEMATICS(041)

**BLUE PRINT FOR HALF YEARLY EXAM: CLASS X**

Chapter	VSA (1 mark)	SA – I (2 marks)	SA – II (3 marks)	LA (4 marks)	Total
Real Numbers	1(1)	2(1)	6(2)	--	9(4)
Polynomials	1(1)	2(1)	3(1)	4(1)	10(4)
Pair of Linear Equations in two variables	1(1)	--	3(1)	4(1)	8(3)
Quadratic Equations	--	2(1)	3(1)	4(1)	9(3)
Arithmetic progression	1(1)	2(1)	3(1)	4(1)	10(4)
Coordinate Geometry	1(1)	2(1)	3(1)	4(1)	10(4)
Introduction to Trigonometry	1(1)	2(1)	6(2)	4(1)	13(5)
Triangles	--	--	3(1)	8(2)	11(3)
<b>Total</b>	<b>6(6)</b>	<b>12(6)</b>	<b>30(10)</b>	<b>32(8)</b>	<b>80(30)</b>

**MARKING SCHEME FOR HALF YEARLY EXAM**

SECTION	MARKS	NO. OF QUESTIONS	TOTAL
VSA	1	6	08
SA – I	2	6	12
SA – II	3	10	30
LA	4	8	32
<b>GRAND TOTAL</b>			<b>80</b>

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**SUBJECT: MATHEMATICS**  
**CLASS : X**

**MAX. MARKS : 80**  
**DURATION : 3 HRS**

**General Instructions:**

- (i). All questions are compulsory.
- (ii). This question paper contains **30** questions divided into four Sections A, B, C and D.
- (iii). **Section A** comprises of 6 questions of **1 mark** each. **Section B** comprises of 6 questions of **2 marks** each. **Section C** comprises of 10 questions of **3 marks** each and **Section D** comprises of 8 questions of **4 marks** each.
- (iv). Use of Calculators is not permitted

**SECTION – A**

1. If  $\tan 9\theta = \cot \theta$  and  $9\theta < 90^\circ$ , then find the value of  $\operatorname{cosec} 5\theta$ .
2. Given that  $\operatorname{HCF}(306, 657) = 9$ , find  $\operatorname{LCM}(306, 657)$ .
3. For which value of  $k$  will the following pair of linear equations have no solution?  
 $3x + y = 1$  and  $(2k - 1)x + (k - 1)y = 2k + 1$
4. Find a quadratic polynomial whose zeroes are 3 and 2.
5. Find the value of  $x$  for which  $(8x + 4)$ ,  $(6x - 2)$  and  $(2x + 7)$  are in AP.
6. Find the coordinates of a point A, where AB is the diameter of a circle whose centre is  $(2, -3)$  and B is  $(1, 4)$ .

**SECTION – B**

7. Show that  $12^n$  cannot end with the digit 0 or 5 for any natural number  $n$ .
8. If  $-1$  is one of the zeroes of the polynomial  $p(x) = 3x^3 - 5x^2 - 11x - 3$ , find the other two zeroes.
9. Find the zeroes of the quadratic polynomial  $3x^2 - x - 4$  and verify the relationship between the zeroes and the coefficients.
10. Which term of the AP 3, 8, 13, 18,..... will be 55 more than its 20<sup>th</sup> term?
11. Find the roots of the equation  $2x^2 - x + \frac{1}{8} = 0$ .
12. Evaluate:  $\frac{4}{\cot^2 30^\circ} + \frac{1}{\sin^2 30^\circ} - 2 \cos^2 45^\circ - \sin^2 0^\circ$

**SECTION – C**

13. Solve :  $(a - b)x + (a + b)y = a^2 - 2ab - b^2$  and  $(a + b)(x + y) = a^2 + b^2$
14. Prove that  $5 - 3\sqrt{2}$  is an irrational number.
15. If  $d$  is the HCF of 56 and 72, find  $x, y$  satisfying  $d = 56x + 72y$ . Also show that  $x$  and  $y$  are not unique.

16. If  $\alpha, \beta$  are the zeroes of the polynomials  $f(x) = x^2 - 2x + 5$ , then find the quadratic polynomial whose zeroes are  $\alpha + \beta$  and  $\frac{1}{\alpha} + \frac{1}{\beta}$
17. Prove that  $\frac{\sin A}{\cot A + \operatorname{cosec} A} = 2 + \frac{\sin A}{\cot A - \operatorname{cosec} A}$ .
18. If  $(\tan \theta + \sin \theta) = m$  and  $(\tan \theta - \sin \theta) = n$  prove that  $(m^2 - n^2)^2 = 16mn$
19. If the sum of first 7 terms of AP is 49 and that of first 17 terms is 289, find the sum of first  $n$  terms.
20. Find the roots of the equation  $2x^2 - 5x + 3 = 0$ , by method of completing the square.
21. Diagonals of a trapezium ABCD with  $AB \parallel CD$  intersects at O. If  $AB = 2CD$ , find the ratio of areas of triangles AOB and COD.
22. Find the ratio in which the  $y$ -axis divides the line segment joining the points  $(5, -6)$  and  $(-1, -4)$ . Also find the point of intersection.

### SECTION – D

23. If  $\operatorname{cosec} \theta - \sin \theta = m$  and  $\sec \theta - \cos \theta = n$ , prove that  $(m^2 n)^{2/3} + (mn^2)^{2/3} = 1$
24. 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how many rows are the 200 logs placed and how many logs are in the top row?
25. If two zeroes of the polynomial  $3x^4 + 6x^3 - 2x^2 - 10x - 5$  are  $\sqrt{\frac{5}{3}}$  and  $-\sqrt{\frac{5}{3}}$ , find the other zeroes of the polynomial.
26. Prove that “In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.
27. In an equilateral triangle ABC, D is a point on side BC such that  $BD = \frac{1}{3} BC$ . Prove that  $9AD^2 = 7AB^2$ .
28. Find the area of the quadrilateral whose vertices, taken in order, are  $(-4, -2)$ ,  $(-3, -5)$ ,  $(3, -2)$  and  $(2, 3)$ .
29. Draw the graphs of the equations  $5x - y = 5$  and  $3x - y = 3$ . Determine the co-ordinates of the vertices of the triangle formed by these lines and the  $y$  axis.
30. Two water taps together can fill a tank in 6 hours. The tap of larger diameter takes 9 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.