

# FULL SYLLABUS TEST

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Subject : MATHEMATICS

Class X (SA - 01)

Time Allowed: 180 Minutes

Max. Marks: 90

## SECTION - A

Q01. The decimal expansion of the rational expression  $\frac{154787}{1250}$  will terminate after.....?

Q02. If the zeroes of  $x^2 + (a+1)x + b$  are 2 and -3, then values of  $a$  and  $b$  are.....

Q03. In  $\Delta ABC$ ,  $PQ \parallel BC$ , if  $AP = 1.5\text{cm}$ ,  $PB = 3\text{cm}$ ,  $AQ = 1.3\text{cm}$  then  $QC = \dots\dots\dots$

Q04. If  $\cos 9\theta = \sin \theta$  and  $9\theta < 90^\circ$ , then the value of  $\tan 5\theta$  is.....

Q05. If  $\sin \theta - \cos \theta = 0$  then the value of  $(\sin \theta + \cos \theta)$  is.....

Q06. Statement:  $n^2 - 1$  is divisible by 8, if  $n$  is an even integer. True/ False?

Q07. The LCM and HCF of two positive numbers are  $l$  and  $h$  respectively. If one integer is  $a$  then, the other will be.....

Q08. The of equations  $x = a$  and  $y = b$  graphically represents lines which are intersecting at.....

## SECTION - B

Q09. Prove that:  $\tan^2 \theta + \cot^2 \theta + 2 = \sec^2 \theta \operatorname{cosec}^2 \theta$ .

Q10. If -1 is one zero of  $p(x) = 3x^3 - 5x^2 - 11x - 3$ , find the other two zeroes.

Q11. Find the HCF of 867 and 255 with the help of Euclid's division algorithm.

Q12. If  $\sin \theta + \cos \theta = \sqrt{3}$ , then prove that:  $\tan \theta + \cot \theta = 1$ .

Q13. Three angles of a triangle are  $x$ ,  $y$  and  $40^\circ$ . The difference between the two angles  $x$  and  $y$  is  $30^\circ$ . Find  $x$  and  $y$ .

Q14. In  $\Delta PQR$ , S is any point on QR such that  $\angle RSP = \angle RPQ$ . Prove that  $RS \times RQ = RP^2$ .

## SECTION - C

Q15. Find mode of the following distribution:

Height (in cm)	No. of Students
150 - 155	12
155 - 160	9
160 - 165	14
165 - 170	10
170 - 175	5

Q16. Two towers of heights 10m and 30m stand on a plane ground. If the distance between their feet is 15m, find the distance between their tops.

Q17. Mean of the following data is 21.5, find the missing value  $k$  :

$x$ : 5 15 25 35 45

$f$ : 6 4 3  $k$  2

Q18. X and Y are points on the sides PQ and PR respectively of a  $\Delta PQR$ . If the lengths of PX, QX, PY and YR (in centimeters) are 4, 4.5, 8 and 9 respectively. Then show that  $XY \parallel QR$ .

Q19. Prove that  $\frac{3\sqrt{3} + 2}{5}$  is irrational.

Q20. Show that any positive odd integer is of the form  $8m+1$  or  $8m+5$  or  $8m+7$ , where  $m$  is some positive integer.

Q21. Ram scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each right answers and 2 marks been deducted for each wrong answer, then he would have scored 50 marks. How many questions were there in the test?

Q22. If  $a^2 \sec^2 \theta - b^2 \tan^2 \theta = c^2$  then, prove that:  $\sin^2 \theta = \frac{c^2 - a^2}{c^2 - b^2}$ .

Q23. If the polynomial given as follow  $p(x) = x^4 - 3x^2 + 5x + 3$  is divided by  $x^2 - 2$ , the remainder is  $ax + b$ . What will be the quotient? Find also the values of  $a$  and  $b$ .

Q24. Prove the identity:

$$\frac{1}{\operatorname{cosec} A - \cot A} - \frac{1}{\sin A} = \frac{1}{\sin A} - \frac{1}{\operatorname{cosec} A + \cot A}$$

## SECTION - D

Q25. Find the mean marks by step deviation method for the following data:

Marks	No. of Students
Below 10	4
Below 20	10
Below 30	18
Below 40	28
Below 50	40
Below 60	70

Q26. Let ABCD is a parallelogram. E is the

midpoint of CD. The line segment joining B and E intersect AC in L and AD produced in M. Prove that  $LM = 2BL$

**Q27.** Prove that the area of the equilateral triangle drawn on the hypotenuse of a right angled triangle is equal to the sum of the areas of the equilateral triangles drawn on the other two sides of the triangle.

**Q28.** The height (in cm.) of 60 persons of different age groups are shown in the table below:

Height (in cm.)	No. of persons
145 – 150	8
150 – 155	10
155 – 160	9
160 – 165	15
165 – 170	10
170 – 175	8

Using the above data, draw 'more than' ogive curve. Also find the median of the data from the graph of ogive.

**Q29.** State and prove converse of Pythagoras theorem.

**OR** Prove that the ratio of areas of two similar triangles is equal to the square of the ratio of their corresponding sides

**Q30.** If  $\operatorname{cosec}\theta - \sin\theta = m$  and  $\sec\theta - \cos\theta = n$ , prove that:  $(m^2n)^{2/3} + (mn^2)^{2/3} = 1$ .

**Q31.** Determine the remaining zeroes of  $3x^4 + 6x^3 - 2x^2 - 10x - 5$ , if two of its zeroes are  $\pm\sqrt{\frac{5}{3}}$ .

**Q32.** The median of distribution given on your right side (on the top) is 14.4. Find the values of  $x$  and  $y$ , if the total frequency is 20.

Class interval	Frequency
0 – 6	4
6 – 12	$x$
12 – 18	5
18 – 24	$y$
24 – 30	1

**Q33.** Evaluate the following:

$$\frac{\sec^2(90^\circ - \theta) - \cot^2 \theta}{2(\sin^2 25^\circ + \sin^2 65^\circ)} + \frac{2\sin^2 30^\circ \tan^2 32^\circ \tan^2 58^\circ}{3(\sec^2 33^\circ - \cot^2 57^\circ)}$$

**OR** Prove:  $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$ .

**Q34.** Draw the graphs of the following equations:

$$2y + x = 13 \text{ and } 2x - y = 1.$$

(i) Find the solution of the equations from the graph drawn.

(ii) Shade the triangular region formed by the lines and  $y$ -axis.

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### General Instructions:

(i) All the questions are compulsory.

(ii) The question paper consists of **34 questions** divided into **four sections, section A, B, C and D**. Questions of Section A are of **1 mark** each, questions of Section B are of **2 marks** each, questions of Section C are of **3 marks** each and, questions of Section D are of **4 marks** each.

(iii) Use of calculators is **not** permitted.