



BALVANTRAY MEHTA VIDYA BHAWAN  
ANGURIDEVI SHERSINGH MEMORIAL ACADEMY

UNIT TEST-1 (2017-2018)

Class -X

TIME: 1½ HRS.

SUBJECT-MATHEMATICS

M.M:40

GENERAL INSTRUCTIONS:

1. All questions are compulsory.
2. The question paper consist of 21 question divided into four sections – A,B,C and D. Section A contains 10 questions of 1 mark each , Section B is of 5 question of 2 marks each. Section C is of 4 questions of 3 marks each and section D is of 2 questions of 4 marks each.
3. Use of calculator is not permitted.

SECTION-A

- Q1 Find the quadratic polynomial whose zeros are 5 and -2.
- Q2 If 1 is a zero of the polynomial  $p(x)=ax^2-3(a-1)x-1$ , then find the value of a.
- Q3 Find the value of  $\sin^2 37^\circ + \cos^2 37^\circ$ .
- Q4 Two concentric circles of radii a and b ( $a > b$ ) are given. Find the length of the chord of the larger circle which touches the smaller circle.
- Q5 Find the value of  $\sin(45^\circ + \theta) - \cos(45^\circ - \theta)$
- Q6 TP and TQ are the two tangents to a circle with centre O, so that  $\angle POQ = 100^\circ$ , what is the value of  $\angle PTQ$ ?
- Q7 What are the maximum number of zeros of a polynomial of degree 'n'?
- Q8 One equation of a pair of dependent linear equation is  $-5x + 7y = 2$ , what is the second equation?
- Q9 For what value of k, the pair of equations  $2x + 3y + 5 = 0$  and  $kx + 4y = 10$ , has a unique solution?
- Q10 If  $\tan \theta = \frac{a}{b}$ , find the value of  $\frac{a \sin \theta + b \cos \theta}{a \sin \theta - b \cos \theta}$

SECTION-B

- Q11 Obtain the zeros of quadratic polynomial  $\sqrt{3}x^2 - 8x + 4\sqrt{3}$  and verify the relationship between its zeros and coefficients.
- Q12 If  $\tan 2\theta = \cot(\theta + 6^\circ)$ , where  $2\theta$  and  $\theta + 6^\circ$  are acute angles, find the value of  $\theta$

- Q13 If  $\sin A = 1/3$ , evaluate  $\cos A \operatorname{cosec} A + \tan A \sec A$ .
- Q14 A circle touches all the four sides of a Quadrilateral ABCD, prove that  $AB + CD = BC + DA$ .
- Q15 Evaluate:  $\left(\frac{\sin 35^\circ}{\cos 55^\circ}\right)^2 + \left(\frac{\cos 55^\circ}{\sin 35^\circ}\right)^2 - 2 \cos 60^\circ$

SECTION-C

- Q16 Obtain the zeros of  $3x^4 + 6x^3 - 2x^2 - 10x - 5$ , if two of its zeros are  $\sqrt{\frac{5}{3}}$  and  $-\sqrt{\frac{5}{3}}$ .
- Q17 For what value of  $k$  will the following pair of linear equations have infinitely many solutions:  
 $2x - 3y = 7$   
 $(k+1)x + (1-2k)y = 5k - 4$
- Q18 Solve the following pair of equations:

$$\frac{1}{3x+y} + \frac{1}{3x-y} = \frac{3}{4}$$

$$\frac{1}{2(3x+y)} - \frac{1}{2(3x-y)} = \frac{-1}{8}$$

- Q19 Draw the graphs of the equations  $x - y + 1 = 0$  and  $3x + 2y - 12 = 0$ . Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis.

SECTION-D

- Q20 Roohi travels 300 km to her home partly by train and partly by bus. She takes 4 hours if she travels 60 km by bus and the remaining by train. If she travels 100 km by bus and the remaining by train, she takes 10 minutes longer. Find the speed of the train and the bus.
- Q21 The sum of a two digit number and the number formed by interchanging its digits is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits in the first number, find the first number.