

# HALF YEARLY EXAMINATION, 2018-19

## MATHEMATICS

Time : 3 hrs.

Class - X

M.M. : 80

Date – 12.09.2018 (Wednesday)

Name of the student \_\_\_\_\_ Section \_\_\_\_\_

### General Instructions :

The question paper comprises 30 questions divided into four sections.

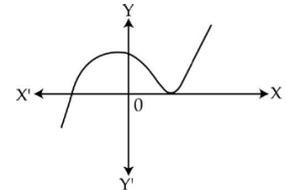
- All questions are compulsory to attempt.
- Section A comprises 6 questions of 1 mark each.
- Section B comprises 6 questions of 2 marks each.
- Section C comprises 10 questions of 3 marks each.
- Section D comprises 8 questions of 4 marks each.
- Draw a neat diagram wherever needed. Show calculations in fair.
- Use of calculator is not permitted.

### SECTION – A

Q. 1 Does the rational number  $\frac{441}{2^2 \times 5^7 \times 7^2}$  have a terminating or a non-terminating decimal representation?

Q. 2 The graph of  $y = p(x)$  is given below. The number of zeroes of  $p(x)$  are:

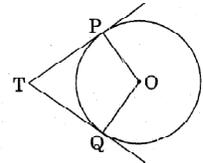
- (a) 0                      (b) 3                      (c) 2                      (d) 4



Q. 3 What is the HCF of the smallest prime number and the smallest composite number?

Q. 4 If the value of discriminant of a quadratic equation is zero, then what will be the nature of its roots?

Q. 5 In the given figure, TP and TQ are two tangents to circle with centre O such that  $\angle POQ = 110^\circ$ , then what will be the value of  $\angle PTQ$ ?



Q. 6 If  $P(E) = 0.35$ , then what is the probability of 'not E' ?

### SECTION – B

Q.7 If HCF and LCM of two numbers are 12 and 72 respectively and if one of the number is 24, find the second number.

Q.8 Which term of AP 2,5,8 ..... is 302 ?

Q.9 Find a quadratic polynomial, the sum and product of whose zeroes are – 3 and 2, respectively.

- Q.10** Find 'y' if the distance between points A(2, y) & B (5,7) is 5 unit.
- Q.11** A box contains cards numbered 1 to 100. A card is drawn at random from the box. Find the probability that the number on the drawn card is  
(i) a perfect cube number      (ii) a perfect square number
- Q.12** When a die is tossed then find the probability to get (i) a prime number (ii) an even prime number.

### SECTION – C

- Q.13** Prove that  $3+2\sqrt{5}$  is irrational.
- Q.14** Show that any positive odd integer is of the form  $4q + 1$  or  $4q + 3$ , where  $q$  is some integer.
- Q.15** Check whether  $t^2 - 3$  is a factor of  $2t^4 + 3t^3 - 2t^2 - 9t - 12$ .
- Q.16** On comparing the ratios  $\frac{a_1}{a_2}$ ,  $\frac{b_1}{b_2}$  and  $\frac{c_1}{c_2}$ , find out whether the following pair of linear equation is consistent, or inconsistent.  $5x - 3y = 11$  ;  $-10x + 6y = -22$

**OR**

Solve the following pair of linear equations  $\frac{3x}{2} - \frac{5y}{3} = -2$  ;  $\frac{x}{3} + \frac{y}{2} = \frac{13}{6}$

- Q.17** Form a pair of linear equation in the following problem, and find its solution:  
If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes  $\frac{1}{2}$  if we only add 1 to the denominator. What is the fraction?

**OR**

For which values of  $p$  does the pair of equations given below has unique solution?

$$4x + py + 8 = 0$$

$$2x + 2y + 2 = 0$$

- Q.18** Find two consecutive positive integers, sum of whose squares is 365.

**OR**

Find the roots of the equation  $5x^2 - 6x - 2 = 0$  by the method of completing the square.

- Q.19** How many two digit numbers are divisible by 3?

**OR**

The 17<sup>th</sup> term of an AP exceeds its 10<sup>th</sup> term by 7. Find the common difference.

- Q.20** Find the sum of first 51 terms of an AP whose second and third terms are 14 and 18 respectively.
- Q.21** Find the point on the  $x$ -axis which is equidistant from (2, -5) and (-2, 9).
- Q.22** Find the ratio in which the line segment joining the points (-3, 10) and (6, -8) is divided by (-1, 6).

## SECTION – D

- Q.23** Obtain all other zeroes of  $3x^4 + 6x^3 - 2x^2 - 10x - 5$ , if two of its zeroes are  $\sqrt{\frac{5}{3}}$  and  $-\sqrt{\frac{5}{3}}$
- Q.24** Find the solution of the following pair of linear equations graphically:  
 $2x + y = 5$ ,  $3x + 2y = 8$
- Q.25** Roohi travels  $300\text{km}$  to her home partly by train and partly by bus. She takes 4 hours if she travels 60 km by train and the remaining by bus. If she travels 100 km by train and the remaining by bus, she takes 10 minutes longer. Find the speed of the train and the bus separately.
- Q.26** In a class test, the sum of Riya's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.

**OR**

Check whether the equation  $3x^2 - 7x - 6 = 0$  has real roots and if it has, find the roots.

- Q.27** The diagonal of a rectangular field is 60 metres more than the shorter side. If the longer side is 30 metres more than the shorter side, find the sides of the field.
- Q.28** In a school, students thought of planting trees in and around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be the same as the class, in which they are studying, e.g., a section of Class I will plant 1 tree, a section of Class II will plant 2 trees and so on till class XII. There are three section of each class. How many trees will be planted by the students?
- Q.29** Find the coordinates of the points of trisection (i.e. points dividing in three equal parts) of the line segment joining the points A (2, -2) and B (-7, 4).

**OR**

If A(-5, 7), B (-4, -5), C (-1, -6) and D (4, 5) are the vertices of a quadrilateral, find the area of the quadrilateral ABCD.

- Q.30** Prove that the parallelogram circumscribing a circle is a rhombus.

**OR**

Prove that the lengths of two tangents drawn from an external point to a circle are equal.

