

# ANNUAL EXAMINATION, 2018-19

## MATHEMATICS

Time : 3 hrs.

Class - IX

M.M. : 80

Date – 14.02.2019 (Thursday)

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

### General Instructions :

- All questions are compulsory.
- The question paper consists of 30 questions divided into 4 sections A, B, C and D. 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 and Section D comprises 8 questions of 4 marks each.
- There is no overall choice. However internal choice have been provided in 2 questions of Section A, 2 questions of Section B, 4 questions of Section C and in 3 questions of Section D. You have to attempt only one of the alternatives in all such questions.
- Use of calculator is not permitted.

### SECTION - A

- Q1. Every irrational number is a real number. State whether the statement is true or false. Also give reason to your answer.
- Q2. Find  $125^{\frac{1}{3}}$ .
- Q3. Find  $p(0)$  for  $p(x) = (x - 1)(x + 1)$ .
- Q4. Find the total surface area of hemisphere of radius 10cm. (use  $\pi = 3.14$ )

**OR**

A cuboidal water tank is 6m long, 5m wide and 4.5m deep. How many litres of water can it hold?

- Q5. The following number of goals were scored by a team in a series of 10 matches.  
2, 3, 4, 5, 0, 1, 3, 3, 4, 3  
Find the median of these scores.

**OR**

Find the mode of 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, 18.

- Q6. The following observations have been arranged in ascending order. If the median of the data is 63, find the value of  $x$   
29, 32, 48, 50,  $x$ ,  $x + 2$ , 72, 78, 84, 95

### SECTION - B

- Q7. Express  $0.\overline{235}$  in the form  $\frac{p}{q}$ , where  $p$  and  $q$  are integers and  $q \neq 0$ .
- Q8. Rewrite the linear equation :  $5 = 2x$  in the form  $ax + by + c = 0$ . Write the values of  $a$ ,  $b$  and  $c$ .

- Q9. (a) How many lines can pass through a given point?  
 (b) In how many points can two distinct lines at the most intersect ?
- Q10. Prove that angle in a semicircle is right angle.
- Q11. A conical pit of top diameter 3.5m is 12m deep. What is its capacity in kilolitres?

**OR**

Find the volume of a sphere whose surface area is  $154\text{cm}^2$ .

- Q12. In a cricket match, a batsman hits a boundary 6 times out of 30 balls he plays. Find the probability that he did not hit a boundary.

**OR**

To know the opinion of the students about the subject statistics, a survey of 200 students was conducted. The data is recorded in the following table.

Opinion	No. of students
like	135
dislike	65

Find the probability that a student chosen at random

- (i) likes statistics (ii) does not like it.

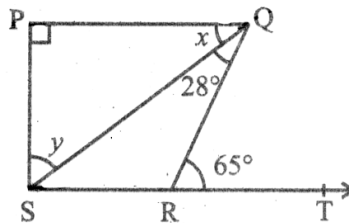
**SECTION- C**

- Q13. Determine whether  $(x + 1)$  is a factor of  $x^4 + 3x^3 + 3x^2 + x + 1$ .

**OR**

Factorise  $6x^2 + 5x - 6$ .

- Q14. Find the value of k if (2,1) is a solution of  $2x + 3y = k$ .
- Q15. In the following figure, if  $PQ \perp PS$ ,  $PQ \parallel SR$ ,  $\angle SQR = 28^\circ$  and  $\angle QRT = 65^\circ$ , then find the values of x and y.



- Q16. Two parallel lines  $l$  and  $m$  are intersected by a transversal  $p$ . Show that quadrilateral formed by the bisectors of interior angles is a rectangle.

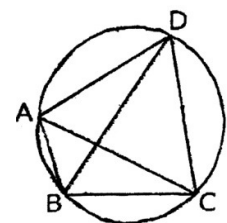
**OR**

Show that diagonals of a rhombus are perpendicular to each other.

- Q17. Prove that the line drawn through the centre of a circle to bisect a chord is perpendicular to the chord.

**OR**

In the following figure, ABCD is a cyclic quadrilateral in which AC and BD are its diagonals. If  $\angle DBC = 55^\circ$  and  $\angle BAC = 45^\circ$ , Find  $\angle BCD$ .



- Q18. Construct a  $\triangle ABC$  in which  $BC = 7\text{cm}$ ,  $\angle B = 75^\circ$  and  $AB + AC = 13\text{cm}$ .
- Q19. An isosceles triangle has perimeter 30 cm and each of the equal sides is 12 cm. Find the area of triangle.
- Q20. The diameter of a roller is 84cm and its length is 120cm. It takes 500 complete revolutions to move once over to level a playground. Find the area of the playground in  $\text{m}^2$ .

**OR**

A solid cube of side 12cm is cut into eight cubes of equal volume. What will be the side of the new cube? Also, find the ratio between their surface areas.

- Q21. The following table gives the distribution of students of class IX-A according to the marks obtained by them.

CLASS IX-A	
Marks	Frequency
0-10	3
10-20	9
20-30	17
30-40	12
40-50	9

Represent the marks of the students of the class on a graph by frequency polygon.

- Q22. A random survey of the number of children of various age groups playing in a park was found as follows :-

AGE(in years)	NUMBER OF CHILDREN
1-2	5
2-3	3
3-5	6
5-7	12
7-10	9
10-15	10
15-17	4

Draw a histogram to represent the data above.

**SECTION- D**

- Q23. Simplify:

$$\frac{\sqrt{5}-2}{\sqrt{5}+2} - \frac{\sqrt{5}+2}{\sqrt{5}-2}$$

**OR**

$$\frac{16 \times 2^{n+1} - 4 \times 2^n}{16 \times 2^{n+2} - 2 \times 2^{n+2}}$$

- Q24. Expand, using suitable identity:

- i)  $(4a - 2b - 3c)^2$
- ii)  $(3a + 4b)^3$

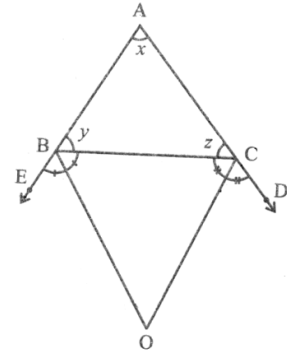
Q25. Factorise:  $4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$ .

Q26. Fill in the blanks:

- (a) The point of intersection of the coordinate axes is \_\_\_\_\_.
- (b) The measure of the angle between the coordinate axes is \_\_\_\_\_.
- (c) The point whose abscissa and ordinate are 2 and -5 respectively, lies in \_\_\_\_\_ quadrant.
- (d) Points (-4,0) and (7,0) lie on \_\_\_\_\_.

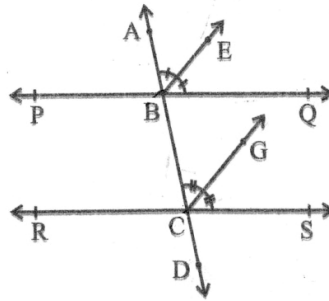
Q27. In the following figure, the sides AB and AC of  $\triangle ABC$  are produced to points E and D respectively. If bisectors BO and CO of  $\angle CBE$  and  $\angle BCD$  respectively meet at point O, then prove that:

$$\angle BOC = 90^\circ - \frac{1}{2} \angle BAC.$$



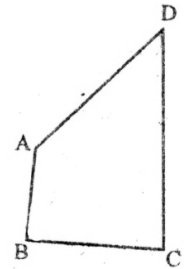
**OR**

If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.



Q28. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD.

Show that  $\angle A > \angle C$  and  $\angle B > \angle D$ .



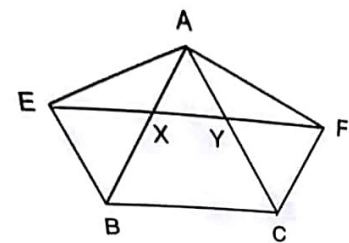
**OR**

Prove that angles opposite to equal sides of an isosceles triangle are equal.

Q29. In the adjacent figure, XY is line parallel to side BC of  $\triangle ABC$ .

BE || AC and CF || AB meet XY at E and F respectively.

Show that  $ar(\triangle ABE) = ar(\triangle ACF)$



Q30. Construct a triangle XYZ in which  $\angle Y = 30^\circ$ ,  $\angle Z = 90^\circ$  and  $XY + YZ + ZX = 11\text{cm}$ .

