NORTH EX PUBLIC SCHOOL
(SENIOR SECONDARY, AFFILIATED TO CBSE)
SCHOOL BLOCK, JAIN NAGAR, SECTOR-38, ROHINI, DELHI-81
HALY YEARLY EXAMINATION , 2023-24
SUBJECT- MATHEMATICS(041)
CLASS-IX

Time Allowed: 3 Hours Maximum Marks: 80

General Instructions :

1. This Question paper contains - five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
2. Section A has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.
3. Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.
4. Section C has 6 Short Answer (SA)-type questions of 3 marks each.
5. Section D has 4 Long Answer (LA)-type questions of 5 marks each.
6. Section E has 3 source based/case based/passage based/integrated units of assessment (4 marks each) with sub parts.

SECTION A

(Multiple Choice Questions ,Each question carries 1 mark)

1. In which quandrant does (x,y) lie, if y is negative and x is positive
   (a) I quadrant(b) II quadrant (c) III quadrant (d) IV quadrant

2.In the ΔABC, if AB=AC, $\angle B=50°$, then A is equal to?
   (a) 50^0 (b)30^0 (c)80^0 (d)40^0

3.In$\Delta\ ABC$ and ΔRPQ , if $\angle A = \angle R$, $\angle B = \angle P$ and AB = RP , which is the criterion of congruency used
   (a) RHS (b) SSS (c) SAS (d)ASA

4.Facts and figures collected for a definite purpose is called?
   (a) Data (b) class mark (c) Range (d) none

5. If ABC=140^0 ,find reflex of ABC.
   (a) 220^0 (b) 40^0 (c) 80^0 (d) 50^0

6..What is the class mark for the class 10 -20.
   (a) 10 (b) 20 (c) 15 (d) 0

7.If abscissa of a point is zero then where does the point lie?
   (a) x axis (b) y axis (c) I quadrant (d) origin

8. Findthe value of k if x= -1 and y = -1 is a solution of equation kx -2y =0.
   (a) 0 (b) 1 (c) 2 (d) -2

9. How many solutions does the line y = 3x + 5 has?
   (a) One solution (b) Infinite solutions (c) no solution (d) ten solutions

10. The compliment of $(90 – a)^0$ is
   (a) 90^0 (b) 180^0 (c) a (d) none

11. If two acute angles of a right triangle are equal , then each acute angle is equal to
   (a) 45^0 (b) 30^0 (c) 60^0 (d) 90^0

12. The mirror image of (-2 , 3) with respect to x axis is
   (a) (2, 3) (b) (-2, -3) (c) (2 ,-3) (d) (-2 , 3)

13. How many angles can be forms by a transversal with pair of line
   (a) 5 (b) 4 (c) 8 (d) 2

14. The sum of rational and irrational number is
(a) Rational number (b) Irrational number (c) integer (d) natural number
15. The graph of the linear equation x = 1 is a line parallel to
(a) x axis (b) y axis (c) passes through origin (d) none
16. The coordinates of the point which lies on y axis at a distance of 4 units in negative direction of y axis
(a) (0, 4) b) (0, -4) (c) (4, 0) (d) (-4 , 0)
17. The perpendicular distance of the point (-3 , -4) from the y axis
(a) 3 units (b) 4 units (c) 6 units (d) none
18. Find the distance between the graphs of x = -2 and x =3
(a) 5 units (b) 6 units (c) 2 units (d) 3 units

ASSERTION-REASON BASED QUESTIONS

In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

19. Assertion (A): $7\sqrt{3} + 3\sqrt{3} = 10\sqrt{3}$
Reason(R): The sum of every rational and irrational number is irrational.
20. Assertion(A): sum of the pair of angles 120^0 and 60^0 is supplementary
Reason(R): Two angles the sum of whose measure is 180^0 are called supplementary angles

SECTION B

(This section comprises of very short answer type-questions (VSA) of 2 marks each)

21. If eleven times the compliment of an angle is 10° greater than 3 times its supplement, then find the measure of the angles.
22. Write 2 solutions for the line 2x + y = 4.
23. Rationalise the denominator $\frac{\sqrt{5}}{3+\sqrt{2}}$
24. Represent $\sqrt{5}$ on the number line.
25. Angles of a triangle are in the ratio 2:4:3 .Find the smallest angle of the triangle.

SECTION C

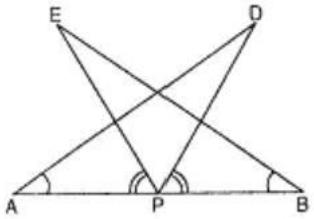
(This section comprises of short answer type questions (SA) of 3 marks each)

26. If $\left(\frac{3}{4}\right)^6 \times \left(\frac{16}{9}\right)^5 = \left(\frac{4}{3}\right)^{x+2}$ find the value of x.

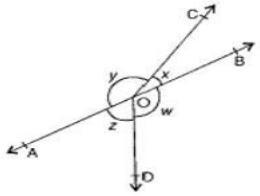
OR

Simplify $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left(\frac{25}{9}\right)^{-\frac{3}{2}}$

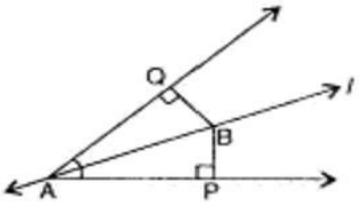
27. The point $(2k-3, k+2)$ lies on the graph of the linear equation $2x + 3y + 15 = 0$,find k.
28. AB is a line segment and p is its mid point, D and Eare point on the same side of AB such that ∠BAD= ∠ ABE and∠ EPA= ∠DPB , show that:
i. $\Delta DAP \cong \Delta EBP$
ii. $AD = BE$



29. In figure, if x + y = w + z , then prove that AOB is a line



30. Line I is the bisector of an angle ∠A and B is any point on I. BP and BQ are perpendicular from B to the arms of ∠A.
    (a) ΔAPB≅ΔAQB
    (b) BP=BQ or B is equidistant from the arms of ∠A.



31. Find the value of a and b in $\frac{3+\sqrt{2}}{3-\sqrt{2}} = a + b\sqrt{2}$

SECTION D

(This section comprises of long answer-type questions (LA) of 5 marks each)

32. The no. of floors in different buildings in a city are as follow:

Building	A	B	C	D
Floors	25	19	15	21

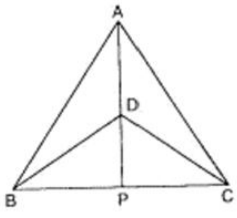
Draw a bar graph. Which 2 building are represented by the tallest and shortest bars in the bar graph?

33. The lengths of the sides of a triangle are 5 cm , 12cm and 13 cm . Find the length of the perpendicular from opposite vertex to the side 13cm long.

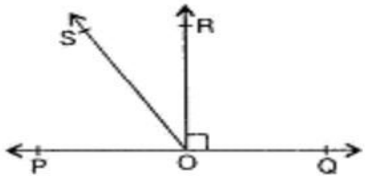
OR

Find the area of a triangle whose perimeter is 180 cm and two of its sides are 80 cm and 18cm. Also find the altitude of the triangle corresponding to the longest side as the base.

34. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC . If AD is extended to intersect BC at P, show that:
    a)ΔABD≅ ΔACD
    b)ΔABP ≅ ΔACP

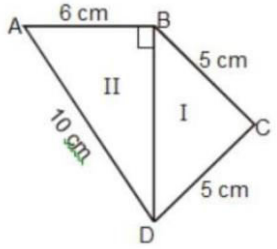


35. In the figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that
    ∠ROS = ½(∠QOS-∠POS)



SECTION E

(This section comprises of 3 case-study/passage-based questions of 4 marks each.)

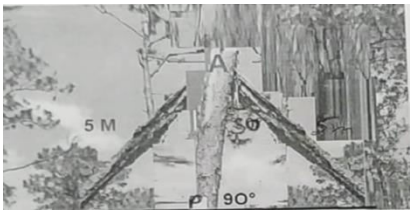


36. Case-Study 1: Read the following passage and answer the questions given below.
Chocolate is in the form of a quadrilateral with sides 6 cm and 10 cm, 5 cm and 5 cm(as shown in the figure) is cut into two parts on one of its diagonal by a lady. Part-I is given to her maid and part II is equally divided among a driver and gardener.

a) Find the area of chocolate given to maid?
b) Find the area of chocolate given todriver and gardener?

37. Case-Study 2: Read the following passage and answer the questions given below.

In a forest, a big tree got broken due to heavy rain and wind. Due to this rain the big branches AB and AC with lengths 5m fell down on the ground. Branch AC makes an angle of 30^{o} with the main tree AP. The distance of Point B from P is 4 m. You can observe that ΔABP is congruent to ΔACP



(a) ΔACP and ΔABP are congruent by which criteria?
(b) What is the length of CP?
(c) What is the value of∠BAP?
(d) What is the value of ∠APB?

38. .Case-Study 3: Read the following passage and answer the questions given below.

After Revision test, teacher prepare the result analysis of the marks scored by 100 students out of 30. Later she prepared the Histogram graph indicating the marks obtained out of 30 100 students. Study the following graph and answer the following questions

a) What are the number of students getting less than twenty marks?
b) Every student belonging to the lowest mark group has to solve 5 problems per day, how many problems will be solved by all the students of this group per day
c) What is the number of students getting more than or equal to 20 marks?