Gurukul Global School
Class - IX
Mathematics-Standard (041)

ASSESSMENT TERM II GGS 2022-23

Date: 28-02-2023 **M.M. 80**
Time: 3 hrs.

General Instructions:

(i) *This Question Paper has 5 Sections A-E.*
(ii) *Section A has 20 MCQs carrying 1 mark each*
(iii) *Section B has 5 questions carrying 02 marks each.*
(iv) *Section C has 6 questions carrying 03 marks each.*
(v) *Section D has 4 questions carrying 05 marks each.*
(vi) *Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.*
(vii) *All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E*
(viii) *Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.*

SECTION-A

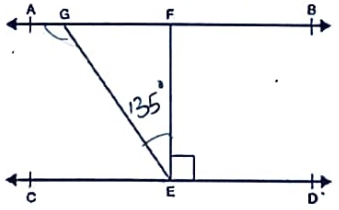
Section A consists of 20 questions of 1 mark each.

1. Between two rational numbers
   a) there is no rational number
   b) there is exactly one rational number
   c) there are infinitely many rational numbers
   d) there are only rational numbers and no irrational numbers (1)

2. $6x - x^3$ is a _____ polynomial.
   a) Linear b) Quadratic
   c) Cubic d) None of the above (1)

3. The three rational numbers between 3 and 4 are:
   a) 5/2, 6/2, 7/2 c) 12/7, 13/7, 14/7
   b) 13/4, 14/4, 15/4 d) 11/4, 12/4, 13/4
   (1)

4. If AB || CD, EF ⊥ CD and ∠GED = 135° as per the figure given below:



The value of ∠AGE is:
   a) 120° b) 140°
   c) 90° d) 135° (1)

5. The decimal representation of the rational number is (1)
   a) Always terminating b) Either terminating or repeating
   c) Either terminating or non-repeating d) Neither terminating nor repeating

6. The irrational number between 2 and 2.5 is

a) $\sqrt{11}$ b) $\sqrt{5}$

c) $\sqrt{22.5}$ d) $\sqrt{12.5}$

7. The coefficient of x^2 in $3x^3+2x^2-x+1$ is:

a) 1 b) 2

c) 3 d) -1 (1)

8. The value of $p(t) = 2+t+2t^2-t^3$ when $t=0$ is

a) 2 b) 1

c) 4 d) 0 (1)

9. If $x^2+kx+6 = (x+2)(x+3)$ for all k, then the value of k is

a) -1 b) 1

c) 3 d) 5 (1)

10. Point (3, 4) lies on the graph of the equation $3y = kx + 7$. The value of k is:

a) 4/3 b) 5/3

c) 3 d) 7/3 (1)

11. The graph of linear equation $x+2y = 2$, cuts the y-axis at:

a) (2,0) b) (0,2)

c) (0,1) d) (1,1) (1)

12. Any point on the y-axis is of the form

a) (y, y) b) (0, y)

c) (x, y) d) (x, 0) (1)

13. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2 : 3, then the greater of the two angles is:

a) 54° b) 108°

c) 120° d) 136° (1)

14. If AD is an altitude of an isosceles triangle ABC in which AB = AC. Then:

a) BD = CD b) BD > CD

c) BD < CD d) None of the above (1)

15. If $\Delta ABC \cong \Delta PQR$, then which of the following is not true?

a) AC = PR b) BC = PQ

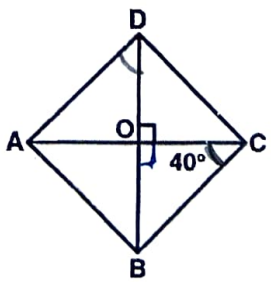
c) QR = BC d) AB = PQ (1)

16. The angles of a quadrilateral are in the ratio 4: 5: 10: 11. The angles are:

a) 36°, 60°, 108°, 156° b) 48°, 60°, 120°, 132°

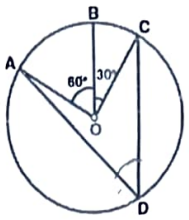
c) 52°, 60°, 122°, 126° d) 60°, 60°, 120°, 120° (1)

17. ABCD is a rhombus such that $\angle ACB = 40°$. Then $\angle ADB$ is



a) 40°
b) 45°
c) 50°
d) 60° (1)

18. In the below figure, the value of ∠ADC is:



a) 60°
b) 30°
c) 45°
d) 55° (1)

DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option:

19. Statement A (Assertion): If the arithmetic mean of 4, 5, 6, 7, 8 and x is 7 then value of x is12.
Statement R(Reason) : The mean is difference of maximum value and minimum value of data.

a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)
c) Assertion (A) is true but reason (R) is false.
d) Assertion (A) is false but reason (R) is true. (1)

20. Statement A (Assertion): If the base of a right triangle is 8 cm and the hypotenuse is 10 cm. Its area will be 40cm^2 . Statement R(Reason) : Area of triangle is half of the product of base and corresponding altitude.

a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A).
c) Assertion (A) is true but reason (R) is false.
d) Assertion (A) is false but reason (R) is true. (1)

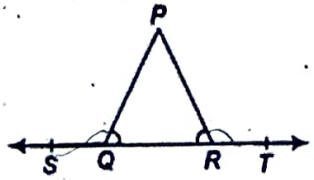
SECTION-B

Section B consists of 5 questions of 2 marks each.

21. A capsule of medicine is in the shape of a sphere of diameter 3.5 mm. How much medicine (in mm^3) is needed to fill this capsule? (2)

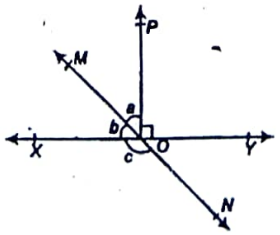
22. Find the remainder when $x^3 - ax^2 + 6x - a$ is divided by $x - a$. (2)

23. In figure, ∠PQR = ∠PRQ, then prove that ∠PQS = ∠PRT.



OR

In figure, lines XY and MN intersect at 0. If ∠POY = 90°, and a : b = 2 : 3, find c. (2)



24. Expand each of the following:
$(2x - y + z)^2$

OR

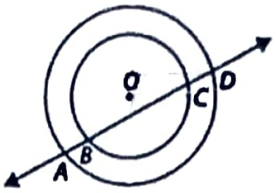
Without actually calculating the cubes, find the value of each of the following:
$(-12)^3 + (7)^3 + (5)^3$ (2)

25. If a point C lies between two points A and B such that AC = BC, then prove that AC = ½ AB, explain by drawing the figure. (2)

SECTION-C

Section C consists of 6 questions of 3 marks each.

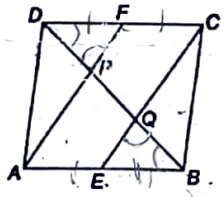
26. If a line intersects two concentric circles (circles with the same centre) with centre O at A, B, C and D, prove that AB = CD.



OR

Prove that angle at a centre of a circle made by an arc is double of the angle made by it in remaining part of a circle. (3)

27. In a parallelogram ABCD, E and F are the mid-points of sides AB and CD, respectively. Show that the line segments AF and EC trisect the diagonal BD.



OR

ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that

a) D is the mid-point of AC
b) MD ⊥ AC
c) CM = MA = ½ AB

(3)

28. Find the area of a triangle two sides of which are 18 cm and 10 cm and the perimeter is 42 cm. (3)

29. A hemispherical bowl made of brass has inner diameter 10.5 cm. Find the cost of tin-plating it on the inside at the rate of ₹16 per 100 cm². (3)

30. Factorise:
$x^3 + 13x^2 + 32x + 20$ (3)

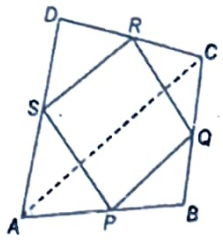
31. Give possible expressions for the length and breadth of the following rectangle, in which the area is given as:
Area = $25a^2 - 35a + 12$ (3)

SECTION-D

Section D consists of 4 questions of 5 marks each.

32. Prove that the line drawn from the mid points of two sides of a triangle is parallel to third side and half of it. (3)

Using above theorem also prove that if ABCD is a quadrilateral in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA and AC is a diagonal. Show that PQRS is a parallelogram. (2)



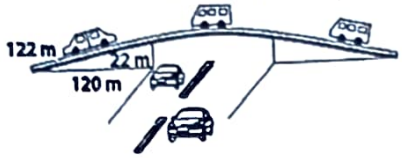
33. A dome of a building is in the form of a hemisphere. From inside, it was white washed at the cost of ₹498.96. If the cost of white washing is ₹2.00 per square metre, find the

a) inside surface area of the dome. (3)

b) volume of the air inside the dome. (2)

OR

The triangular side walls of a flyover have been used for advertisements. The sides of the walls are 122 m, 22 m and 120 m (see figure). The advertisements yield an earning of ₹5000 per m^2 per year. A company hired one of its walls for 3 months. How much rent did it pay? (5)



34. The length of 40 leaves of a plant measured correct to one millimetre and the obtained data is represented in the following table

Length (in mm)	Number of leaves
118 - 126	3
127 - 135	5
136 - 144	9
145 - 153	12
154 - 162	5
163 - 171	4
172 - 180	2

a) Draw a histogram to represent the given data.

b) Is there any other suitable graphical representation for the same data?

c) Is it correct to conclude that the maximum number of leaves is 153 mm long and Why? (5)

35. In countries like USA and Canada, temperature is measured In Fahrenheit, whereas in countries like India, it is measured in Celsius. Here is a linear equation that converts Fahrenheit to Celsius:

$$F = (\frac{9}{5})C + 32$$

a) Draw the graph of the linear equation for the above equation using Celsius for x-axis and Fahrenheit for y-axis. (3)

b) Is there a temperature which is numerically the same in both Fahrenheit and Celsius? If yes, find it. (2)

OR

If (2, 3) and (4, 0) lie on the graph of equation $ax + by = 1$.

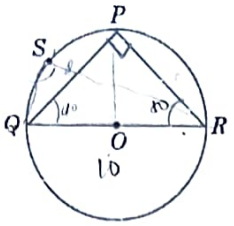
a) Find the values of a and b. (2)

b) Plot the graph of equation obtained. (3)

SECTION-E

Case study based questions are compulsory.

36. Daksh visited a mall with his father. He saw that three shops are situated at P, Q and R as shown in the figure from where they have to purchase things according to their need. Distance between shop P and R is 6m and distance between shop P and Q is 8m.



Considering O as the centre of the circle, answer the following questions:

a) Find the radius of the circle. (1)

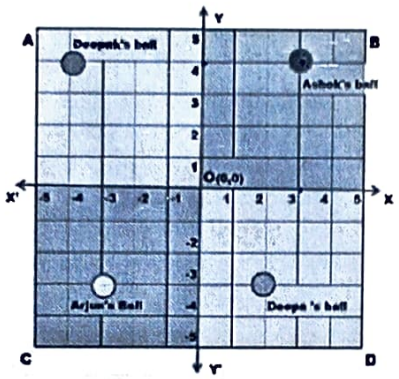
b) If angle ∠PQR= 40° then find measure of ∠PRQ. (1)

c) Find area of ΔPQR.

OR

Find measure of ∠QSP. (2)

37.



There is a square park ABCD in the middle of Saket colony in Delhi. Four children Deepak, Ashok, Arjun and Deepa went to play with their balls. The colour of the ball of Ashok, Deepak, Arjun and Deepa are red, blue, yellow and green respectively. All four children roll their ball from centre point O in the direction of XOY, X'OY, X'OY' and XOY'. Their balls stopped as shown in the above image.

Answer the following questions:

a) What are the coordinates of the ball of Ashok? (1)

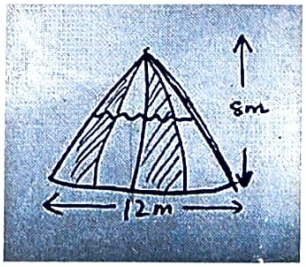
b) What is the line XOX' called? (1)

c) What is the sum of ordinate of the ball of Arjun and Ashok?

OR

What is the difference of abscissa of the ball of Deepak and Deepa? (2)

38. Once four friends Anish, Shiraaz, Ajay and Vijay went for a picnic at a hill station. Due to peak season, they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent in a park.



a) What is the slant height of the tent? (1)

b) What is the area of cloth required for making the tent? (1)

c) What length of tarpaulin 3m wide will be required to make conical tent of height 8m and base diameter 12m? Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm. (Use $\pi = 3.14$)

OR

What is the volume of air inside the tent? (2)

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