Final Examination (2021-22)

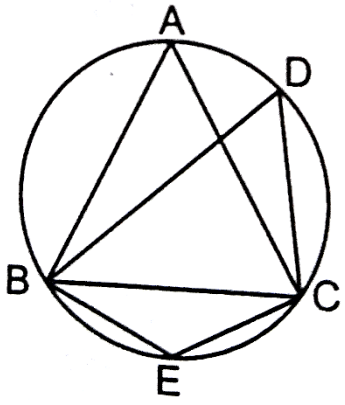
Mathematics

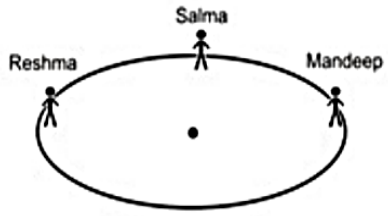
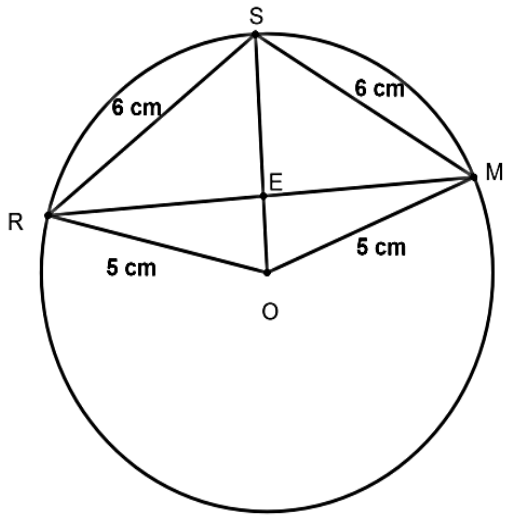
Class - IX

Time Allowed: 2 hours **Max. Marks: 40**

General Instructions:

1. **The question paper consists of 14 questions divided into three sections A, B and C.**
2. **All questions are compulsory.**
3. **Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.**
4. **Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.**
5. **Section C comprises of 4 questions of 4 marks each. Internal choice has been provided in one question. It contains two case study questions.**

SECTION A		
Q No		**Marks**
1	Find the remainder when $4x^3 - 3x^2 + 4x - 2$ is divided by x – 1.	2
2	If the total surface area of sphere is 98.56 cm^2, find the radius of the sphere. OR The outer curved surface areas of hemisphere and sphere are in the ratio 2:9. Find the ratio of their radii.	2
3	The perimeter of one face of a cube is 40 cm. Find the sum of the length of its edges.	2
4	Prove that "A diagonal of a parallelogram divides it into two congruent triangles".	2
5	In the given figure, ΔABC is equilateral. Find ∠BDC and ∠BEC.  OR Prove that a cyclic parallelogram is a rectangle.	2

6	The curved surface area of a right circular cylinder of height 14 cm is $88cm^2$. Find the volume of cylinder.	2
	SECTION B	
Q No		**Marks**
7	If $(2x + 3y) = 12$ and $xy = 6$, find the value of $8x^3 + 27y^3$.	3
8	The height of a cone is 24 cm and diameter of its base is 14 cm. Find the slant height, volume and the total surface area of the cone.	3
9	Write $(4a – 2b – 3c)^2$ in the expanded form.	3
10	Show that the line segments joining the mid points of the opposite sides of a quadrilateral bisect each other. OR In ΔABC, D, E and F are respectively the mid-points of sides AB, BC and CA. Show that ΔABC is divided into four congruent triangles by joining D, E and F.	3
	SECTION C	
Q No		**Marks**
11	Show that (x-2) is a factor of the polynomial $f(x) = 2x^3 – 3x^2 - 17x + 30$ and hence factorise f(x). OR Find the value of the following by using suitable identity (i) $(998)^3$ (ii) 97×105	4
12	Construct a triangle in which BC = 4.5 cm, ∠B = 45° and AB – AC = 2.5cm. Write steps of construction also.	4
13	  Three girls Reshma, Salma and Mandeep are playing with each other standing at points R, S and M respectively on the boundary of a circle of radius 5 m as shown in the figure. Reshma throws a ball to Salma, Salma to Mandeep and Mandeep to Reshma. If the distance between Reshma and Salma and between Salma and Mandeep is 6 meters each and O is the centre of the circle, then answer the following questions: (i) Find the distance between Reshma and Mandeep.	2 2

	(ii) Find the value of length OE.	
14	Many manufacturers/ suppliers rely on pre-shipment/ supply inspection to manage the product quality.  In a factory, over the past 200 working days, the number of defective parts produced by a machine is given in the following table: No. of defective part(s): 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 Days: 50 | 32 | 22 | 18 | 12 | 12 | 10 | 10 | 10 | 8 | 6 | 6 | 2 | 2 Refer to the above information to find the probability that tomorrow's output will have (i) At least one defective part. (ii) Not more than 5 defective parts.	2 2