

**KENDRIYA VIDYALAYA SANGATHAN, TINSUKIA REGION (2018-19)**

**ANNUAL EXAMINATION  
CLASS IX MATHEMATICS (041)**

**MAX. MARKS: 80**

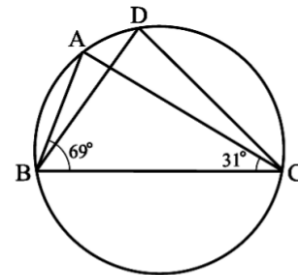
**DURATION: 3 HRS**

General Instruction:

- I. All questions are compulsory.
- II. This question paper contains 30 questions divided into four Sections A, B, C and D.
- III. Section A comprises of 6 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 10 questions of 3 marks each and Section D comprises of 8 questions of 4 marks each.
- IV. There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and three questions of 4 mark each. You have to attempt only one of the alternatives in all such questions.
- V. Use of Calculators is not permitted

**SECTION A**

- 1 Find  $(64/25)^{-3/2}$  1
- 2 Find the value of k if  $x=1, y=1$  is a solution of the equation  $2x - k = -3y$  1
- 3 In the below figure,  $\angle ABC = 69^\circ$ ,  $\angle ACB = 31^\circ$ , find  $\angle BDC$ . 1

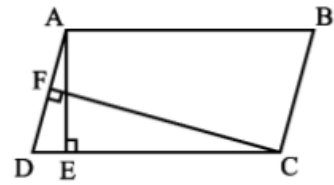


- 4 Find the area of an equilateral triangle whose side  $2\sqrt{3}$ cm. 1
- 5 Find the total surface area of a sphere of radius 10 cm. (Use  $\pi = 3.14$ ) 1
- 6 In a bag, there are 100 bulbs out of which 30 are defective ones. A bulb is taken out of the bag at random. Find the probability of the selected bulb to be a good one. 1

**SECTION B**

- 7 Find the value of the polynomial  $5x - 4x^2 + 3$  at  $x = -1$  2
- 8 Prove that if the diagonals of a quadrilateral bisect each other at right angles, then it is a rhombus. 2

- 9 In the given figure, ABCD is a parallelogram,  $AB \parallel DC$  and  $BC \parallel AD$ . If  $AB = 16$  cm,  $AE = 8$  cm and  $CF = 10$  cm, find AD.



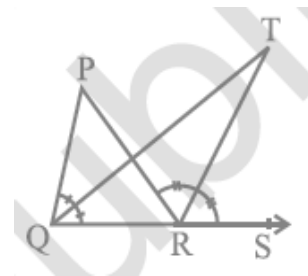
- 10 Sides of a triangle are in the ratio of  $12 : 17 : 25$  and its perimeter is 540cm. Find its area. 2
- 11 A hemispherical bowl made of brass has inner diameter 10.5 cm. Find the cost of tin-plating it on the inside at the rate of Rs.6 per  $100 \text{ cm}^2$ . 2
- 12 The following observations have been arranged in ascending order. If the median of the data is 63, find the value of x. 2  
29, 32, 48, 50, x, x + 2, 72, 78, 84, 95

### SECTION C

- 13 Represent  $\sqrt{3}$  on the number line. 3  
or  
Represent  $\sqrt{9.3}$  on the number line.
- 14 Find the remainder when  $x^4 + x^3 - 2x^2 + x + 1$  is divided by  $x - 1$ . 3
- 15 Solve the equation  $2x+1=x-3$  and represent the solution(s) on 3  
(I) the number line (ii) the Cartesian plane
- 16 If a point C lies between two points A and B such that  $AC = BC$ , then prove that  $AC = \frac{1}{2}AB$ . 3  
Explain by drawing the figure.
- 17 Prove that Lines which are parallel to the same line are parallel to each other. 3

Or

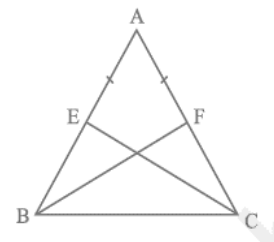
In Fig, the side QR of  $\triangle PQR$  is produced to a point S. If the bisectors of  $\angle PQR$  and  $\angle PRS$  meet at point T, then prove that  $\angle QTR = \frac{1}{2} \angle QPR$ .



- 18 Angles opposite to equal sides of an isosceles triangle are equal. 3

Or

E and F are respectively the mid-points of equal sides AB and AC of  $\triangle ABC$ . Show that  $BF = CE$ .

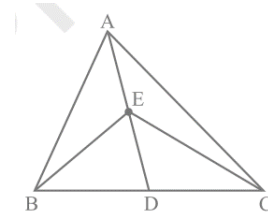


- 19 In  $\Delta ABC$ , E is the mid-point of a median AD. Show that  $\text{ar}(\Delta BED) = \frac{1}{4} \text{ar}(\Delta ABC)$ .

3

Or

In figure, E is any point on median AD of a  $\Delta ABC$ . Show that  $\text{ar}(\Delta ABE) = \text{ar}(\Delta ACE)$

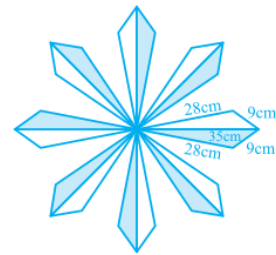


- 20 A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the minor arc and also at a point on the major arc.

3

- 21 A floral design on a floor is made up of 16 tiles which are triangular, the sides of the triangle being 9 cm, 28 cm and 35 cm (see Fig).

3



- 22 Fifty seeds were selected at random from each of 5 bags of seeds, and were kept under standardized conditions favourable to germination. After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follows:

3

What is the probability of germination of

- (i) more than 40 seeds in a bag?
- (ii) 49 seeds in a bag?
- (iii) more than 35 seeds in a bag?

Bag	1	2	3	4	5
Number of seeds germinated	40	48	42	39	41

### SECTION D

- 23 If  $x = 2 + \sqrt{3}$  then find  $x^2 + 1/x^2$

4

- 24 Factorize:  $x^3 - 6x^2 + 11x - 6$

4

Or

Expand:  $(4a - 2b - 3c)^2$ .

- 25 In which quadrant or on which axis do each of the points  $(-2, 4)$ ,  $(-1, 0)$ ,  $(1, 2)$  and  $(-3, -5)$  lie? Verify your answer by locating them on the Cartesian plane.

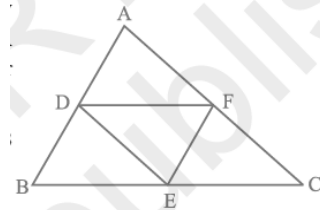
4

- 26 The taxi fare in a city is as follows. For the first kilometer, the fare is Rs. 8, for the subsequent it is Rs. 5 per km. Taking the distance covered as  $x$  km and total fare as Rs  $y$ , write a linear equation for this information, and draw its graph.

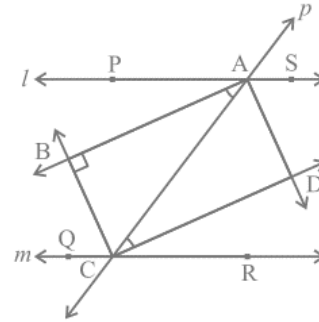
4

- 27 In  $\triangle ABC$ , D, E and F are respectively the mid-points of sides AB, BC and CA. Show that  $\triangle ABC$  is divided into four congruent triangles 4

or



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.



- 28 Construct a triangle ABC, in which  $\angle B = 60^\circ$ ,  $\angle C = 45^\circ$  and  $AB + BC + CA = 11$  cm. 4
- 29 The following table gives the life times of 400 neon lamps: 4

Life time (in hours)	Number of Lamps
300 – 400	14
400 – 500	56
500 – 600	60
600 – 700	86
700 – 800	74
800 – 900	62
900 – 1000	48

- (i) Represent the given information with the help of a histogram.
- (ii) How many lamps have a life time of more than 700 hours?
- 30 The paint in a certain container is sufficient to paint an area equal to  $9.375 \text{ m}^2$ . How many bricks of dimensions  $22.5 \text{ cm} \times 10 \text{ cm} \times 7.5 \text{ cm}$  can be painted out of this container? 4

Or

A village, having a population of 4000, requires 150 litres of water per head per day. It has a tank measuring  $20 \text{ m} \times 15 \text{ m} \times 6 \text{ m}$ . For how many days will the water of this tank last?