केन्द्रीय विद्यालय संगठन, कोलकाता संभाग

KENDRIYA VIDYALAYA SANGATHAN, KOLKATA REGION

सत्रांत परीक्षा / SESSION ENDING EXAMINATION, 2025-26

कक्षा/CLASS-9 **अधिकतम अंक/MAX.MARK 80**

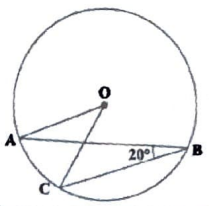
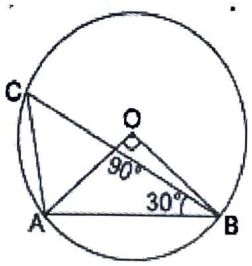
समय/TIME : 3घंटे/Hours

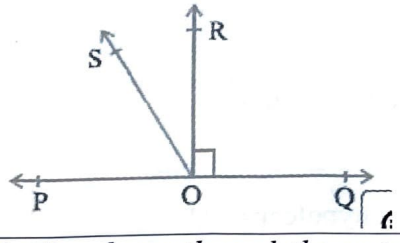
विषय/SUB.-गणित / Mathematics (042)

General Instructions:

- This Question Paper has 5 Sections A, B, C, D and E.
- Section A has 20 MCQs carrying 1 mark each
- Section B has 5 questions carrying 02 marks each.
- Section C has 6 questions carrying 03 marks each.
- Section D has 4 questions carrying 05 marks each.
- Section E has 3 case based integrated units of assessment (04 marks each) with sub- parts of the values of 1, 1 and 2 marks each respectively.
- 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 2 marks questions of Section E

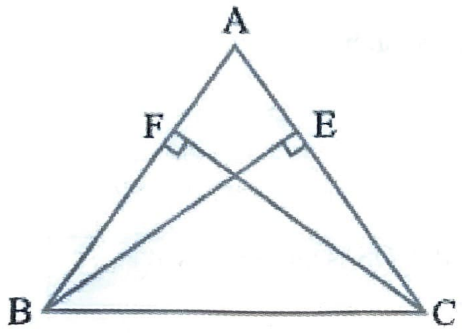
	SECTION A **Section A consists of 20 questions of 1 mark each**	
1	Which of the following is irrational (a)$\frac{\sqrt{4}}{\sqrt{9}}$ (B) 0.1231010200…….. (c)0.2353535…. (d)$\sqrt{81}$	1
2	**$3\sqrt{6} + 4\sqrt{6}$ is equal to:** (a) $6\sqrt{6}$ (b) $7\sqrt{6}$ (c)$4\sqrt{12}$ (d) $7\sqrt{12}$	1
3	The coefficient of x^2 in the expansion of $2x^3 - 2x(4x - 5) + 3$is (a)-8 b) 8 c) -2 d) None of these	1
4	The zero of the polynomial f(x) = 2x+7 is (a) 2/7 (b) -2/7 (c) 7/2 (d) -7/2	1
5	If x+2 is a factor of this polynomial $2x^2+kx$, then the value of k is (a)2 (b)4 (c)3 (d)None of these	1
6	Which of the following is not a solution of linear equation 2x –3y=12 (a) (0,-4) (b) (2,3) (c) (6,0) (d) (3,-2)	1
7	The linear equation 3x-11y =10 has: (a) Unique solution (b) Two solutions (c) Infinitely many solutions (d) No solutions	1
8	Which of the following statement is false? (a) A straight line may be drawn from any one point to any other point. (b) A terminated line cannot be produced indefinitely. (c) A circle can be drawn with any centre and any radius. (d) All right angles are equals to one another.	1

9	Euclid stated that all right angles are equal to each other in the form of: (a) an axiom (b) a definition (c) a postulate (d) a proof	1
10	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
11	In Δ ABC and Δ PQR if AB = QR, BC = PR and CA = PQ, then which is the correct congruent criteria (a) Δ PQR ≅ Δ BCA(b) Δ BAC ≅ Δ RPQ (c) Δ CBA ≅ Δ PRQ(d) Δ ABC ≅ Δ PQR	1
12	If the diagonals of a quadrilateral are equal and bisect at right angles, then the quadrilateral is (a) Square b) Rectangle c) Rhombus d) Parallelogram	1
13	In adjacent figure, if ∠ABC = 20°, then ∠AOC is equal to: (a) 20^0 (b) 50^0 (c) 40^0 (d) 70^0 	
14	Which of the following statement is incorrect? (a) Equal chords of a circle subtend equal angles at the centre. (b)The perpendicular from the centre of a circle to a chord trisects the chord. (c) Angles in the same segment of a circle are equal. (d) Equal chords of a circle are equidistant from the centre	1
15	In the figure, ∠AOB = 90° and ∠ABC = 30°, then ∠CAO is equal to  (a) 30° (b) 45° (c) 90° (d) 60°	1
16	In the class intervals 15 – 25, 25 – 35, the number 25 is included in (a) 15 – 25 (b) 25 – 35 (c) both (d) none	1
17	If volume and surface area of a sphere is numerically equal, then its diameter is a) 2 units b) 3 units c) 4 units d) 6 units	1
18	What is the total surface area of a cone of radius 7cm and height 24cm? (Take $\pi = \frac{22}{7}$) (a) 710 cm^2(b) 704 cm^2 (c) 700 cm^2 (d) 725 cm^2	1

19	Assertion (A):$2+\sqrt{3}$isan irrational number. Reason (R):Sum of a rational number and an irrational number is Always an irrational number. (a) Bothassertion (A) andreason(R) aretrueandreason(R) isthecorrectexplanationofassertion (A). (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A). (c) Assertion (A) is true but reasons (R)is false. (d)Assertion (A) is false but reasons (R) is true.	1
20	Assertion: the sum of two adjacent angle is 100° and one of them is 35° then other is 65° Reason: adjacent angles are always supplementary. (a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion (b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion. (c.) assertion is true but the reason is false. (d.) both assertion and reason are false.	1
	SECTION B **Section B consists of 5questions of 2 mark each**	
21	Find four rational numbers between $\frac{1}{3}$ *and* $\frac{1}{2}$	2
22	Locate $\sqrt{5}$ on the number line	2
23	In the given figure POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$  	2
24	*The line drawn through the centre of a circle to bisect a chord is perpendicular to the chord.* *OR* If the non-parallel sides of a trapezium are equal, prove that it is cyclic.	2
25	The hollow sphere, in which the circus motorcyclist performs his stunts, has a diameter of 7 m. Find the area available to the motorcyclist for riding. Or The height of a cone is 16 cm and its base radius is 12 cm. Find the curved surface area of the cone (Use $\pi = 3.14$).	2

SECTION- C

Section C consists of 6 questions of 3 marks each

26	(a) Rationalise the denominator of $\frac{1}{2+\sqrt{3}}$ (b) Find the value of $125^{-\frac{1}{3}}$	3
27	Verify : $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$	3
28	Find four different solutions of the equation x + 2y = 6.	3
29	*Prove that angles opposite to equal sides of an isosceles triangle are equal.* *Or* ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively .Show that these altitudes are equal.  (i)△APD ≅△CQB (ii) AP = CQ (iii) △AQB ≅△CPD (iv) AQ = CP (v) APCQ is a parallelogram	3
30	***Prove that a diagonal of a parallelogram divides it into two congruent triangles.*** 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 (i) D is the mid-point of AC (ii) MD ⊥AC	3
31	A circular park of radius 20m is situated in a colony. Three boys Ankur, Syed and David are sitting at equal distance on its boundary each having a toy telephone in his hands to talk each other. Find the length of the string of each phone.	3

SECTION -D

Section D consists of 4 questions of 5 marks each

32	(a) Find the value of k, if x – 1 is a factor of $4x^3 + 3x^2 - 4x + k$ (b) Factorise :$x^3 - 3x^2 - 9x - 5$	5 marks

33	In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ given in figure Show that:	5
34	The surface area of a sphere of radius 5 cm is five times the area of the curved surface of a cone of radius 4 cm. Find the height and the volume of the cone. **OR** A dome of a building is in the form of a hemisphere. From inside, it was white-washed at the cost of Rs. 4989.60. If the cost of white-washing is Rs. 20 per square metre, find the (i) Inside surface area of the dome. (ii) Inner radius of the dome. (iii) Volume of the air inside the dome.	5
35	In a city, the weekly observations made in a study on the cost of living index are given in the following table:	5

Cost of living index	Number of weeks
140-150	5
150-160	10
160-170	20
170-180	9
180-190	6
190-200	2
Total	52

Draw a frequency polygon for the data above (without constructing a histogram).
Also answer the following
(i) What is the class-mark for the class interval 170–180?
(ii) How many weeks had a cost of living index between 160 and 170?

Or

100 surnames were randomly picked up from a local telephone directory and a frequency distribution of the number of letters in the English alphabet in the surnames was found as follows:

Number of letters	Number of surnames
1-4	6
4-6	30
6-8	44
8-12	16
12-20	4
Total	100

(i) Draw a histogram to depict the given information.
(ii) Write the class interval in which the maximum number of surnames lie.

SECTION -E

Section E consists of 3 questions of 4 marks each

36

In Class IX, mathematics teacher asked to students about polynomials, which has variables x and y. Then out of these polynomials, following are represented by

$p(x) = 4x^2 - 2x + 2$ at$x$=2, $q(y) = y^2 - 2y + 1$ at $y = 1$ and $r(y) = 3y^3 - 4y + \sqrt{11}$ at y =2

Then students solved these equations to get best appreciation from teacher side and to exchange themselves practice for doing excellent performance in half yearly and yearly exams.

Based on the above information, answer the following questions.

(i) Which is the cubic polynomial? 1

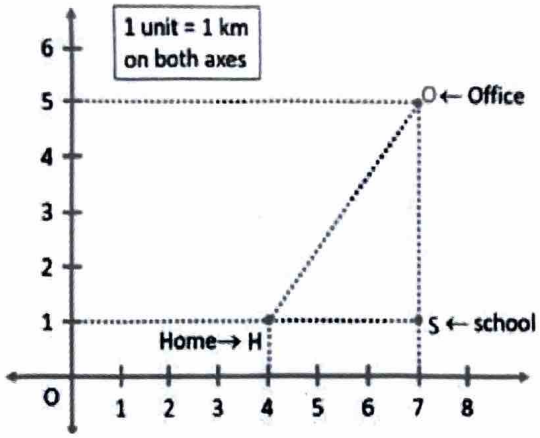
(a) P(x) (b) q(y) (c) r(y) (d) None of these

(ii) Write one example of a binomial of degree 41. 1

(iii) Calculate the value of polynomial $r(y) = 3y^3 - 4y + \sqrt{11}$ at y =2 2

37

Saumya has to reach her office every day at 10:00 am. On the way to her office, she drops her son at school. Now, the location of Saumya's house, her son's school and her office are represented by the map below. Using the details given, answer the following questions.



Observe the above graph answer the following.

(i) Find the coordinates of Saumya's home. 1

(a) (1, 4) (b) (4, 1) (c) (7, 1) (d) (1, 7)

(ii) Find the coordinates of Saumya's son's school. 1

(a) (1, 4) (b) (4, 1) (c) (7, 1) (d) (1, 7)

(iii) Find the distance between Saumya's home and her son's school. 1

(iv) Find the distance between Saumya's office and her son's school. 1

38 Ramanandam is a gardener. He made a triangular park of sides 120 m, 80 m and 50 m. He has to put a fence all around it and also plant grass inside the park.

Help him to find the answer of the following questions.

(a) How much area does he need to plant grass? 1

(b) Find the longest altitude of the triangle (triangular park). 1

(c) Find the cost of fencing it with barbed wire at the rate of Rs. 20 per metre, leaving a Space of 3 m wide for a gate on one side. 2