केंद्रीय विद्यालय संगठन, जयपुर संभाग
KENDRIYA VIDYALAYA SANGATHAN ,JAIPUR REGION
PRACTICE PAPER : 2024-25
कक्षा / CLASS : 10
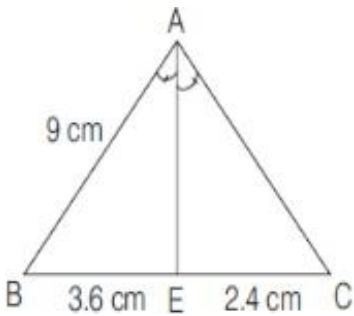## विषय / SUB: MATHEMATICS BASIC (कोड / CODE : 241)

अधिकतम आवधि / **Time Allowed: 3 Hours**   अधिकतम अंक/ **Maximum Marks: 80**

सामान्य निर्देश / General Instructions:

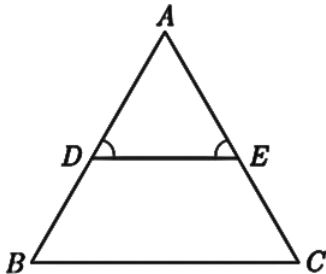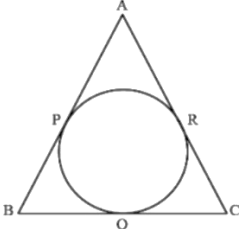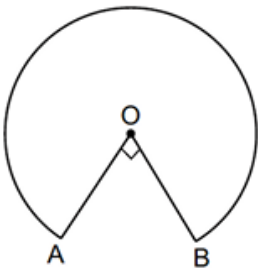Read the following instructions carefully and follow them:

1. This question paper contains 38 questions.

2. This Question Paper is divided into 5 Sections A, B, C, D and E.

3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.

4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.

5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.

6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.

7. In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.

8. All Questions are compulsory. However, an internal choice in 2 Questions of section B, 2 Questions of section C and 2 Questions of section D has been provided. And internal choice has been provided in all the 2 marks questions of Section E.

9. Draw neat and clean figures wherever required.

10. Take π =22/7 wherever required if not stated.

11. Use of calculators is not allowed.

S.No.	Section A	Marks

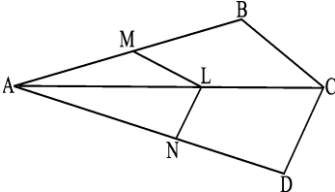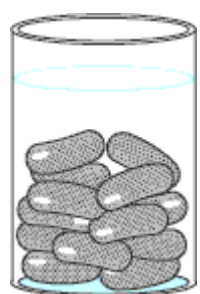|		
1.	The pair of equations $3x + 2y + 7 = 0$ and $6x + 4y + 14 = 0$ has (a) Unique solution (b) exactly two solution (c) infinitely many solution (d) no solution	1
2.	The prime factorization of 1250 is (a) 2×5^4 (b) $2 \times 3 \times 5^4$ (c) 2×5^6 (d) $5^4 \times 3 \times 5$	1
3.	What is the common zero if the polynomials $x^2 - 1$ and $x^2 - 2x + 1$ simultaneously? (a) 4 (b) 3 (c) 2 (d) 1	1
4.	The HCF of two numbers is 116 and their LCM is 1740. If one number is 580, then the other number is (a) 580 (b) 348 (c) 680 (d) 448	1
5.	A quadratic polynomial, the sum and product of whose zeroes are – 3 and 2, respectively. (a). $x^2 + 3x + 2$ (b) $x^2 + 3x - 2$ (c) $x^2 - 5x + 6$ (d) $x^2 + 5x - 6$	1
6.	In $\triangle ABC$, the angle bisector of $\angle A$ cuts BC at E. Find the length of AC, if lengths of AB, BE and EC are 9 cm , 3.6 cm and 2.4 cm. (a) 5.4 cm (b) 8 cm (c) 4.8 cm (d) 6 cm	1
7.	If triangle *ABC* is similar to triangle *DEF* such that $2AB = DE$ and $BC = 8$ cm then *EF=……….* (a) 20 cm (b) 10 cm (c) 8 cm (d) 16 cm	1
8.	The mid-point of the line segment joining the points (-7,9) and (-3,5) is . *(a) (5/2, 7/2)* *(b) (2,7)* *(c) (- 5,7)* *(d) (5, 2)*	1
9.	The value of $(1 + \tan^2 \beta)(1 - \sin \beta)(1 + \sin \beta) = $ …….. . (a) 1 (b) 2 (c) 3 (d) 0	1
10.	If 5 tan θ = 4, then the value of $\frac{5\sin\theta - 3\cos\theta}{5\sin\theta + 3\cos\theta}$ is $(a) \frac{1}{6}$ (b) $\frac{1}{7}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$	1
11.	If $y \cot 45^0 \cos 60^0 = \sin 30^0 \sin 90^0$, then the value of y is (a) 1/2 (b) -1 (c) 1 (d) 2	1

12.	What is the area of a segment of a circle of radius 21cm , if the arc of the segment has a measure of 60^0 is ($\sqrt{3} = 1.73$) (a) 45 cm^2 (b) 40 cm^2 (c) 40.8 cm^2 (d) 40.3 cm^2	1
13.	In the given figure, PA and PB are tangents to the circle with centre O. If ∠APB = 60°, then ∠OAB is (a) 30° (b) 60° (c)90° (d) 15°	1
14.	The area of a quadrant of a circle where the circumference of circle is 220m, is (a) 962 (b)960 (c) 962.5 (d) 905	1
15.	The total surface area of a hemisphere of radius r is (a) πr^2 (b) $3\pi r^2$ (c) $\pi r h$ (d) $2\pi r^2$	1
16.	Find the mean of the first *10* natural number (a) 4.5 (b) 7.2 (c) 2.8 (d) 5.5	1
17.	The mode and mean is given by 7 and 8, respectively. Then the median is: (a) 1/13 (b)13/3 (c) 23/3 (d) 33	1
18.	Which of the following cannot be the probability of an event ? (a) 0.4 (b) 4% (c) 0.004% (d) 4	1
	Directions for question 19 & 20 : In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as: (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion. (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion. (c) Assertion is true but Reason is false. (d) Assertion is false but Reason is true.	
19.	Assertion: (2+√3)√3 is an irrational number . Reason**:** Porduct of two irrational number is always irrational	1
20.	**Assertion (A):** The point (0,7) lies on Y-axis **Reason (R):** The x-coordinate of the point on Y- axis is zero.	1

SECTION - B

21.	Find the zeroes of the quadratic polynomial $5x^2 - 4 - 8x$ and verify the relationship between the zeroes and the coefficients of the polynomial..	2
22.	If sin (A + B) = 1 and cos (A – B) = √3/2, 0°< A + B ≤ 90° and A > B, then find the measures of angles A and B. **OR** Prove that : $\sec^4 A - \sec^2 A = \tan^4 A + \tan^2 A$	2
23.	In the given figure $\dfrac{AD}{DB} = \dfrac{AE}{EC}$ and ∠D = ∠E then prove that- △BAC is isosceles triangle .	2
24.	In figure. If AB =AC. Prove that B Q = Q C or B C is bisected at Q 	2
25.	The length of the minute hand of a clock is 6cm. Find the area swept by it when it moves from 5:25 pm to 6:00 pm **OR** In the given figure, the shape of the top of a table is that of a sector of a circle with centre O and ∠AOB = 90°. If AO = OB = 42 cm, then find the perimeter of the top of the table.	2
	SECTION - C	
26.	Prove that √3 is an irrational number.	3
27	Solve the following pair of linear equations. 0.2x + 0.3y = 1.3 0.4x + 0.5y = 2.3 **OR** For which value of k will the following pair of linear equations have no solution? 3x + y = 1 , (2k – 1) x + (k – 1) y = 2k + 1	3

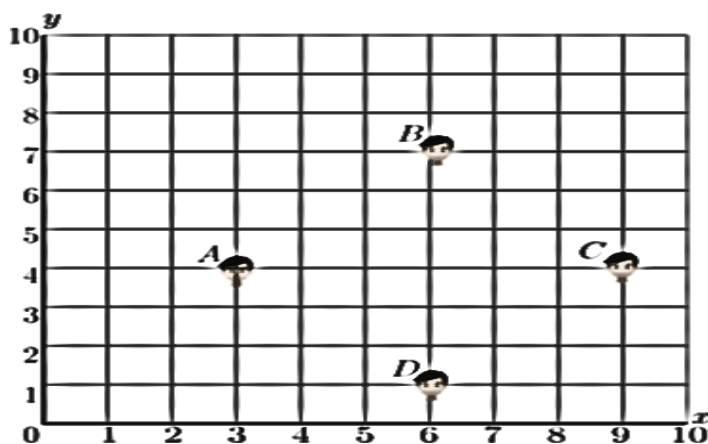| 28.	If $\alpha \ and \ \beta$ are zeros of $2x^2 - 7x + 3$, find the value of $\alpha^2 + \beta^2$.	3
29.	Prove that: $(\operatorname{cosec} \theta - \cot \theta)^2 = \dfrac{(1-\cos \theta)}{(1+\cos \theta)}$	3
30.	Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre. **OR** Prove that "The lengths of tangents drawn from an external point to a circle are equal."	3
31.	In a single throw of two dice, find the probability of (i) A doublet (ii) An odd number as a sum (iii) A number less than 3 on each die.	3

SECTION – D

32.	(a) In an AP, if $S_5 + S_7 = 167$ and $S_{10} = 235$, then find the AP, where s, denotes the sum of its first n terms. (b) The angles of a triangle are in A.P., the least being half the greatest. Find the angles. **OR** Solve the following pair of linear equations graphically: x + 3y = 6 ; 2x – 3y = 12 Also find the area of the triangle formed by the lines representing the given equations with y-axis.	5
33.	Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio. Using above theorem in the given figure If LM‖CB and LN‖CD, Prove that $\dfrac{AM}{AB} = \dfrac{AN}{AD}$	5
34.	A gulab-jamun, contains sugar syrup up to about *30%* of its volume. Find approximately how much syrup would be found in *45* gulab-jamuns, each shaped like a cylinder with two hemispherical ends with length *5 cm* and diameter *2.8cm* **OR** Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively decided to provide place and the canvas for 1500 tents and share the whole expenditure equally. The lower part of each tent is cylindrical with base radius 2.8 m and height 3.5 m and the upper part is conical with the same base	5

radius, but of height 2.1 m. If the canvas used to make the tents costs ₹120 per m^2, find the amount shared by each school to set up the tents.

| 35. | The median of the following data is 137. Find the values of x and y, If the total frequency is 68. | | | | | | | | 5 |

Class Intervals	65-85	85-105	105-125	125-145	145-165	165-185	185-205
Frequency	4	X	13	20	14	y	4

SECTION E

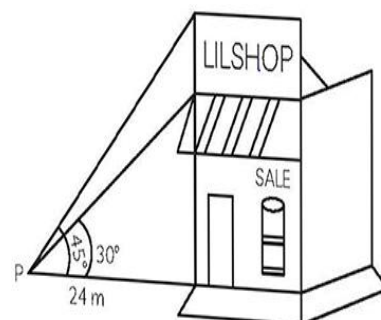| 36.	Morning assembly is an integral part of the school's schedule. Almost all the schools conduct morning assemblies which include prayers, information of latest happenings, inspiring thoughts, speech, national anthem, etc. A good school is always particular about their morning assembly schedule. Morning assembly is important for a child's development. It is essential to understand that morning assembly is not just about standing in long queues and singing prayers or national anthem, but it's something beyond just prayers. All the activities carried out in morning assembly by the school staff and students have a great influence in every point of life. The positive effects of attending school assemblies can be felt throughout life. Have you noticed that in school assembly you always stand in row and column and this make a coordinate system. Suppose a school have 100 students and they all assemble in prayer in 10 rows as given below.	
		1
	Here A, B, C and D are four friend Amar, Bharat, Charls and Dravid. i. What is the distance between A and B? ii. What is the distance between A and C? iii. What is the distance between D and B? **OR** Which diagram will form the seating arrangement of these 4 friends?	1 1 2

37.		
	Anita purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building. From a point P on the ground level, the angle of elevation of the roof of the building is 30° and the angle of elevation of the top of the sign board is 45°. The point P is at a distance of 24 m from the base of the building. On the basis of the above information, answer the		1

following questions: ($\sqrt{3} = 1.73$)

    a.   Find the height of the sign board.   1

    b.   Find the distance of the point P from the top of the sign board.

    c.   Find the height of the building (without the sign board).

OR

    Find the height of the building (with the sign board)   2

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38.   A road roller (sometimes called a roller-compactor, or just roller) is a compactor-type engineering vehicle used to compact soil, gravel, concrete, or asphalt in the constructio of roads and foundations. Similar rollers are used also at landfills or in agriculture. Road rollers are frequently referred to as steamrollers, regardless of their method of propulsion. RCB Machine Pvt Ltd started making road roller 10 year ago. Company increased its production uniformly by fixed number every year. The company produces 800 rollers in the 6th year and 1130 roller in the 9th year.

    i.   What was the company's production in first year?   1

    ii.   What was the increase in the company's production every year ?   1

    iii.   What was the company's total production of the first 6 years?   2

OR

    In which year the company's production was 1350 rollers?