अनुक्रमांक / **ROLL NO** सेट / **SET: A**

केंद्रीय विद्यालय संगठन, जयपुर संभाग

KENDRIYA VIDYALAYA SANGATHAN,JAIPUR REGION

प्रथम प्री बोर्ड परीक्षा/ 1ST PRE BOARD EXAMINATION : 2024-25

कक्षा / CLASS : 10

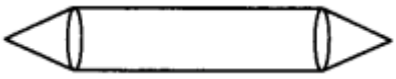
विषय / SUB: MATHEMATICS BASIC (कोड / CODE : 241)

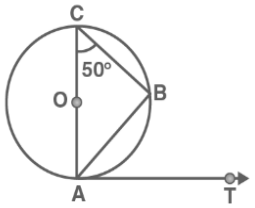
अधिकतम आवधि / Time Allowed: 3 Hours अधिकतम अंक/ **Maximum Marks: 80**

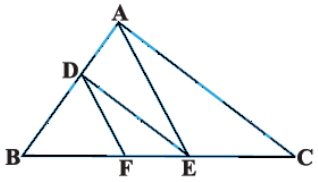
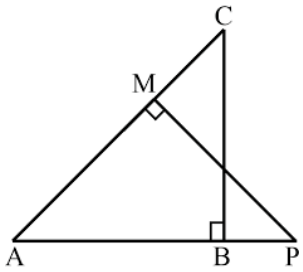
सामान्य निर्देश / General Instructions:

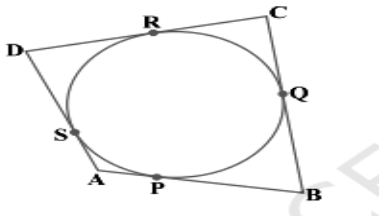
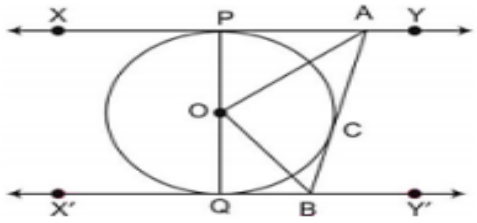
Read the following instructions carefully and follow them:

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. An 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.

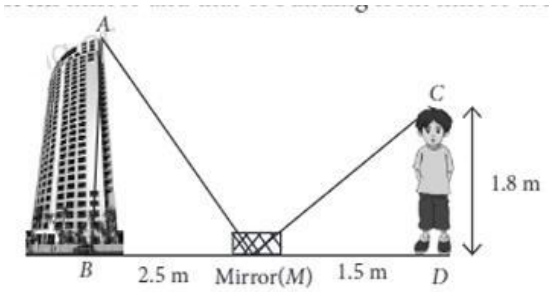
S.No.	SECTION A	Marks
1	Number of zeros of a quadratic polynomial (a) 2 (b) Atleast 2 (c) Atmost 2 (d) less than 2	1
2	For what value of k does the system of equations x+2y=3 and 5x+ky+7=0 have no solution. (a) k=10 (b) k=$\frac{-7}{3}$ (c) k=2 (d) k≠10	1
3	The midpoint of a line segment joining two points A(2, 4) and B(-2, -4) is (a) (-2, 4) (b) (2, -4) (c) (0, 0) (d) (-2, -4)	1
4	The distance of the point P (2, -3) from the x-axis is (a) 3 (b) – 3 (C) –2 (d) 2	1
5	If the common difference of an arithmetic progression is -2 and the first term is 10, what is the 5th term? (a) 18 (b) 12 (c) 2 (d) -2	1
6	A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1 cm and the height of the cone is equal to its radius. Find the volume of the solid in terms of π. (a) 2π (b) π/2 (c) π/9 (d)π	1
7	A Parabola curve represents the -------- polynomial . (a) Linear (b) quadratic (c) cubic (d) Bi-Quadratic	1
8	The area of the circle that can be inscribed in a square of 6cm is (a) 36π cm^2 (b) 18π cm^2 (c) 12 π cm^2 (d) 9π cm^2	1
9	The median of a set of 9 distinct observations is 20.5. If each of the largest 4 observation of the set is increased by 2, then what is the median of the new set? (a) no change (b) increased by 2 (c) information inadequate (d) none of the above	1
10	If the sum of the roots of the quadratic equation $3x^2 + (2k + 1)x - (k + 5) = 0$ equal to the product of roots, then the value of k is (a) 2 (b) 4 (c) 3 (d) 5	1
11	If cos x = $\frac{2}{3}$ then tan x is equal to: (a) $\frac{5}{2}$ (b) $\sqrt{\frac{7}{2}}$ (c) $\frac{\sqrt{5}}{2}$ (d) $\frac{2}{\sqrt{5}}$	1
12	The shape of a gilli, in the gilli-danda game is a combination of.  (a) two cones and a cylinder (b) a cone and a cylinder (c) two cylinders (d) two cylinders and a cone	1
13	For the following distribution,	1

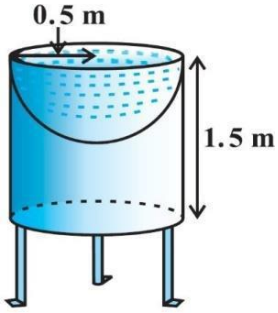
	<table><tr><td>C.I</td><td>0-5</td><td>5-10</td><td>10-15</td><td>15-20</td><td>20-25</td></tr><tr><td>frequency</td><td>10</td><td>15</td><td>12</td><td>20</td><td>9</td></tr></table> the sum of the lower limits of the median and modal class is (a) 15 (b) 25 (c) 30 (d) 35	
14	2 cards of hearts and 4 cards of spades are missing from a pack of 52 cards. A card is drawn at random from the remaining pack. What is the probability of getting a black card ? (a) $\frac{11}{23}$ (b) $\frac{12}{23}$ (c) $\frac{13}{23}$ (d) $\frac{23}{26}$	1
15	AB is a chord of the circle and AOC is its diameter such that ∠ACB = 50°. If AT is the tangent to the circle at the point A, then ∠BAT is equal to**.**  (a) 65° (b) 50° (c) 60° (d) 40°	1
16	If the height and length of a shadow of a tower are the same, then the angle of elevation of Sun is (a) 30° (b) 60° (c) 45° (d) 15°	1
17	PA and PB are tangents from an exterior point P to a circle with centre O. Then the quadrilateral OAPB must be a: - (a) Rhombus (b) Square (c) Rectangle (d) Cyclic Quadrilateral	1
18	If E be an event such that P(E)=3/7 then P(not E) is equal to (a) 4/7 (b) 6/7 (c) 5/7 (d) 1	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 (a) Both assertion (A) and reason (R) are true and reason (R) is the correctexplanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correctexplanation of assertion (A) (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true. .	
19	**Assertion:** 8^n cannot end with digit 0. **Reason:** The prime factorisation of $8^n = (2\times2\times2)^n$,does not consist 5 as a factor	1
20	Assertion (A): If the radius of sector of a circle is 7 cm and angle is 60° then the length of arc is $\frac{77}{6}$ cm. Reason (R): The length of the arc subtending angle θ at the centre of a circle of radius r is $\frac{\pi r\theta}{180}$	1
	SECTION B	

21	Find the coordinates of the point which divides the join of (–1, 7) and (4, –3) in the ratio 2 : 3.	2
22	Two dice are thrown at the same time. Find the probability of getting (i) Doublet (ii) The sum of the two numbers appearing on the top of the dice is 7. **OR** A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be (i) Red ? (ii) Not green?	2
23	Given that HCF (306, 657) = 9, find LCM (306, 657) **OR** Find the HCF and LCM of 144, 180 and 192 by prime factorization method.	2
24	Evaluate: $\frac{5cos^2 60° + 4sec^2 30° - tan^2 45°}{sin^2 30° + cos^2 30°}$	2
25	If Q(0, 1) is equidistant from P(5, –3) and R(x, 6), find the values of x.	2
	SECTION C	
26	Prove that $\sqrt{5}$ is an irrational number.	3
27	In given figure DE || AC and DF || AE. Prove that : $\frac{BF}{FE} = \frac{BE}{EC}$  **OR** In Fig. ABC and AMP are two right angled triangles, right angled at B and M respectively. Prove that: (i) Δ ABC ~ Δ AMP (ii) $\frac{CA}{PA} = \frac{BC}{MP}$  	3
28	The product of two odd consecutive integers is 143. Is the condition possible if so find the integers.	3
29	If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of the polynomial $2x^2 - 5x - 3$, then find the values of p and q.	3
30	Prove that: $\sqrt{\frac{1 + \sin A}{1 - \sin A}} = \sec A + \tan A$	3
31	In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find:	3

	(i) The length of the arc (ii) Area of the sector formed by the arc **OR** To warn ships for underwater rocks, a lighthouse spreads a red coloured light over a sector of angle 80° to a distance of 16.5 km. Find the area of the sea over which the ships are warned. (Use $\pi = 3.14$)	
	SECTION D	
32	(a)(i) Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu? (ii) The larger of two supplementary angles exceeds the smaller by 18 degrees. Find them. **OR** (b) Solve the following system of linear equations graphically: $x+2y = 3$, $2x-3y+8 = 0$ Also find the area of shaded triangular region bounded by these lines and axes	3+2 5
33	(a)(i) Prove that the length of two tangants drawn from an exterior point on a circle are equal. (ii) quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC.  **OR** (b) In the figure XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C interesting XY at A and X'Y' at B, what is the measure of ∠AOB.  	2+3 5
34	Two poles of equal heights are standing opposite to each other, on either side of the road, which is 80m wide. From a point between them on the road, the angles of elevation of top of the poles are 60 and 30 respectively. Find the height of the poles.	5
35	If the median of the distribution given below is 28.5, find the values of *x* and *y* **OR** The lengths of 40 leaves of a plant are measured correct to the nearest millimetre and data obtained is represented in the following table. Find the median length of the leaves.	5

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	Total
Frequency	5	x	20	15	y	5	60

	lengths of leaves(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		
	SECTION E			
36	In the month of April to June 2022, the exports of passenger cars from India increased by 26% in the corresponding quarter of 2021–22, as per a report. A car manufacturing company planned to produce 1800 cars in 4th year and 2600 cars in 8th year. Assuming that the production increases uniformly by a fixed number every year. Based on the above information answer the following questions.  (i) Find the production in the 1st year. (ii) Find the production in the 12th year. (iii) (a) Find the total production in first 10 years. **OR** (iii) (b)In how many years will the total production reach 31200 cars?			1 1 2
37	Ram is a student of class X, One day his math teacher gave an activity to measure the height of the building. Ram accepted the challenge and places a mirror on ground level to determine the height of building .He is standing at a certain distance so that he can see the top of the building reflected from mirror. Ram's eye level is at 1.8m above the ground. The distance of Ram from the mirror and that of building from mirror are 1.5m and 2.5m respectively.  Based on the above information, answer the questions: (i) Name the triangles which are similar and also mentioned which criterion of similarity is applied here? (ii) What is the height of the building? (iii) (a) If Δ ABM and ΔCDM are similar where CD = 6cm, MD = 8 cm and BM = 24cm, then find the length of AB? **OR**			1 1 2

	(b) If the ratio of the height of a tower and length of its shadow on the ground is $\sqrt{3}$: 1 what is the angle of elevation of the sun ?	
38	Ashish wants to make a bird bath for his garden in the shape of cylinder of height 1.5m and radius 0.5 m with a hemispherical depression at one end, stands on three cylindrical pillars of radius 7 cm and height 2 m using POP as shown in figure.  i) Find the curved surface area of the cylindrical part. ii) Find the curved surface area of hemispherical depression. iii) (a) Find the volume of the three pillars. **OR** (b) What is the curved surface area of 3 pillars?	1 1 2