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

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केंद्रीय विद्यालय संगठन, जयपुर संभाग
KENDRIYA VIDYALAYA SANGATHAN ,JAIPUR REGION
प्रथम प्री बोर्ड परीक्षा / **1ST PRE BOARD EXAMINATION : 2024-25**
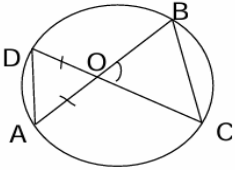## कक्षा / CLASS : 10
विषय / SUB: MATHEMATICS STANDARD (कोड / CODE : 041)

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.

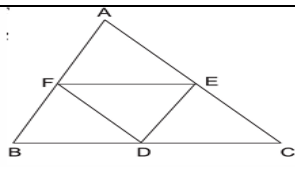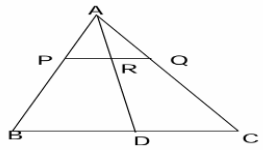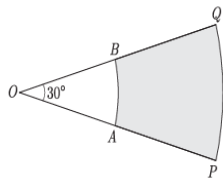| S.No.	Section A	Marks
1.	A quadratic polynomial, the sum of the zeroes is 0 and one zero is 3 is: (a) $x^2 - 9$ (b) $x^2 + 9$ (c) $x^2 + 3$ (d) $x^2 - 3$	1

2.	A pair of linear equations in two variables is said to be consistent if
	    (a) It has a solution (either a unique or infinitely many).
	    (b) It has unique solution only.
	    (c) It has no solution.
	    (d) None of these.
		1

3.	If TP and TQ are the two tangents to a circle with centre O so that $\angle POQ = 110°$, then $\angle PTQ$ is equal to. (a) 60° (b) 70° (c) 80° (d) 90°	1
4.	If the nth term of an A.P. is (2n+1), then the sum of first n terms of the A.P. is (a) n (n-2) (b) n (n+2) (c) n (n+1) (d) n (n-1)	1
5.	A right circular cylinder of radius r and height (h >2r) just encloses a sphere of diameter (a) r (b) 2r (c) h (d) 2h	1
6.	If $\csc^2\theta (1 + \cos \theta)(1 - \cos \theta) = k$, then the value of k is (a) 1 (b) -1 (c) 0 (d) 2	1
7.	The length of a tangent from a point A at a distance 5 cm from the centre of the circle is 4 cm. The radius of the circle is: (a) 2.5 cm (b) 3 cm (c) 3.5 cm (d) 2 cm	1
8.	A polynomial of degree n has: (a) Only one zero (b) At least n zeroes (c) More than n zeroes (d) At most n zeroes	1
9.	If for a data, Mean: Median= 9:8, then Median: Mode= (a) 8 : 9 (b) 4 : 3 (c) 7 : 6 (d) 5: 4	1
10.	O is the point of intersection of two chords AB and CD of a circle. If $\angle BOC = 80°$ and OA = OD then ΔODA and ΔOBC are (a) Equilateral and similar (b) isosceles and similar (c) Isosceles but not similar (d) not similar	1
11.	If $\frac{1}{2}$ is the root of the quadratic equation $x^2 - mx - \frac{5}{4} = 0$, then value of m is: (a) 2 (b) -2 (c) -3 (d) 3	1
12.	If $\theta = 60°$ then the value of $3\cot\theta$ is (a) 1 (b) $1/\sqrt{3}$ (c) $\sqrt{3}$ (d) not defined	1
13.	An 8 cm edge cube is cut into several small cubes of edge 2 cm. Number of small cubes formed are (a) 62 (b) 60 (c) 61 (d) 64	1
14.	A number is selected at random from the numbers 1 to 30. The probability that it is a prime number is (a) $\frac{2}{3}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) $\frac{11}{30}$	1
15.	Find the ratio in which the line segment joining (2,-3) and (5, 6) is divided by x-axis. (a) 1:2 (b) 2:1 (c) 2:5 (d) 5:2	1
16.	While computing mean of the grouped data, we assume that the frequencies are (a) Evenly distributed over all the classes (b) Centred at the class marks of the class (c) Centred at the upper limit of the class (d) centred at the lower limit of the class	1
17.	The point (1,3) divides the line segment of points P(-1, 7) and (4, -3) in what ratio: (a) 2:3 (b) 3:2 (c) 3:4 (d) 4:3	1

18.	A card is drawn from a well shuffled deck of playing cards. The probability of getting red face card is (a) $\frac{3}{13}$ (b) $\frac{1}{2}$ (c) $\frac{3}{52}$ (d) $\frac{3}{26}$	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:** 8^n ends with digit 0 for some positive integer n. **Reason:** Prime factorization of a number ending with digit 0 is of the form $2^a \times 5^b$, where a and b are positive integers.	1
20.	**Assertion (A):** **Reason (R):** The length of the arc subtending angle θ at the centre of a circle of radius r = $\frac{\pi r \theta}{360}$.	1

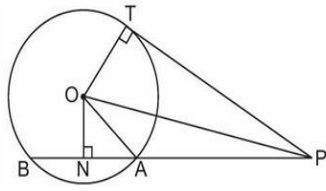|	**SECTION - B**	
21.	(a) If HCF of 96 and 404 is expressible in the form $404m + 96n$ such that $m = 5$, then find the value of n **OR** (b) In a court, there are three bells which toll at an interval of 48 seconds, 30 seconds and 36 seconds respectively. They tolled together at 7:00 AM, when will they toll together again, at the earliest?	2
22.	(a) 1000 tickets of a lottery were sold and there are 5 prizes on these tickets. If Saket has purchased one lottery ticket, what is the probability of winning a prize in percent? **OR** (b) Two customers, Shyam and Ekta, are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day as on another day. What is the probability that both will visit the shop on (i) Consecutive days? (ii) Different days?	2
23.	If sin A = $\frac{\sqrt{3}}{2}$, then find the value of 2 cot ^{2}A -1.	2
24.	The coordinates of one end point of a diameter of a circle as (4,-1) and the coordinates of the centre of the circle are (1,-3). Find the coordinates of the other end of the diameter.	2
25.	Find a relation between x and y such that the point (x,y) is equidistant from the points (7, 1) and (3, 5).	2

	SECTION - C	
26.	If sec θ + tan θ = p, Find sin θ?	3
27	Given that √5 is irrational, prove that 2√5-3 is an irrational number.	3
28.	If α and β are the zeroes of the quadratic polynomial f(x)= kx² + 4x + 4 such that α² + β²= 24, find the values of k.	3

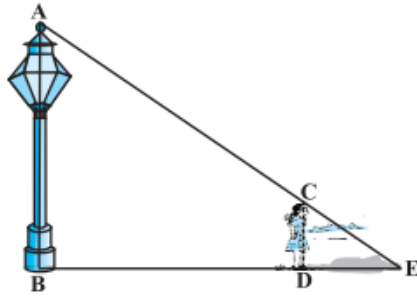| 29.	(a) In Δ ABC, D, E and F are midpoints of BC, CA and AB respectively. Prove that $\triangle FBD \sim \triangle DEF$ and $\triangle DEF \sim \triangle ABC$. **OR** (b) In Δ ABC, P and Q are points on AB and AC respectively such that PQ is parallel to BC. Prove that the median AD drawn from A on BC bisects PQ.	3
30.	A road which is 7m wide surrounds a circular park whose circumference is 88m. Find the area of the road. **OR** PQ and AB are two arcs of concentric circles of radii 7cm and 3.5 cm respectively, with centre O. If $\angle$ POQ = 30º , then find the area of shaded region.	3
31.	Solve the following Equations and find x and y : 152x – 378y + 74 = 0 -378x + 152y+604 = 0	3

	SECTION – D	
32.	(a) (i) For what value of k, which the following pair of linear equations have infinitely many solutions: and 2x+3y= 7 and (k+ 1)x+ (2k-1)y= 4k+1. (a) (ii) The students of a class are made to stand in rows. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. Find the number of students in the class. **OR** (b) The cost of 2 kg of apples and 1kg of grapes on a day was found to be Rs. 160. After a month, the cost of 4kg of apples and 2kg of grapes is Rs. 300. find the cost of 1 kg apple and 1kg grapes? Represent the situations graphically ? also find area of triangle whose base is x axis?	2+3 5
33.	The given figure from external point P, a tangent PT and a line segment PAB are drawn to a circle with centre O. ON is perpendicular to the chord AB. Prove that (i) PA. PB = PN² - AN² (ii) PN² - AN² = OP² - OT²	5
34.	Two poles of equal heights are standing opposite to each other on either side of a road, which is 80 m wide. From a point between them on the road, angles of elevation of their top are 30º and 60º. Find the height of the poles and distance of point from poles.	5

35.	The distribution below gives the makes of *100* students of a class, if the median makes are *24*, find the frequencies f_1 and f_2								5

Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
No. of students	4	6	10	f_1	25	f_2	18	5

OR

Find the value of x and y from the following data if its mode is 65

Class	0-20	20-40	40-60	60-80	80-100	100-120	Total
Frequency	6	8	x	12	y	5	47

SECTION E

36	A thief, after committing a theft, runs on his bike at a speed of 43 m/min and his speed by 2m/min every succeeding minute. After 3 minutes, a policeman runs on his jeep to catch him. He goes 70m in the first minute and increases his speed by 5 m/min every succeeding minute.
	    (i) Find the Nth term for thief if police man runs for n minutes?
	    (ii) Find the sum of nth term for policeman?
	    (iii) (a) After how many minutes policeman will catch the thief?
	                          OR
	    (iii) (b) If policeman runs on his jeep with uniform speed of 80 m/min. Then after how many minutes he will catch the thief?
		1
		1
		2

37.	Teewan, Arun and Pankaj were celebrating the festival of Diwali in open ground with firecrackers. There is a pedestal in the ground. Suddenly Teewan stands on a pedestal and releases a sky lantern from the top. Teewan, Arun, Pankaj Based on the above information, answer the following questions.	

(i) If the position of Pankaj is 25 m away from the base of the pedestal and angle r = 30°, then find the height of the pedestal.

(ii) If the vertical height of the sky lantern from the top of the pedestal is 12 m and angle y = 30°, then find the distance between Teewan and the sky lantern?

(iii) (a) If the height of the pedestal is 30 m, angle t = 45° and angle z = 30°, then find the horizontal distance between Arun and Pankaj.

OR

(iii) (b) angle q = 60° and the position of Arun is 15 m away from the base of the pedestal, then find distance of Pankaj angle r = 30° from the base of the pedestal?

(i)	1
(ii)	1
(iii)	2

38.	A girl of height 90 cm is walking away from the base of a lamp-post for 4 seconds at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, then	
	(i) From which criteria Δ ABE and Δ CDE are similar?	1
	(ii) What is the ratio of length AE to length AC?	1
	(iii) (a) Length of Shadow DE?	2
	OR	
	(b) If length of shadow is 1.2 m, then find the length of AE?	