KENDRIYA VIDYALAYA KANNUR

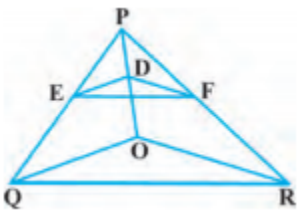
PRE-BOARD-PRACTICE TEST

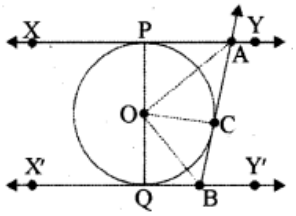
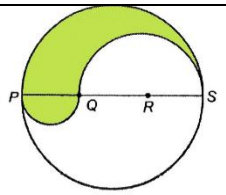
Class- X Time: 3 Hrs Sub- MATHEMATICS M.M :80

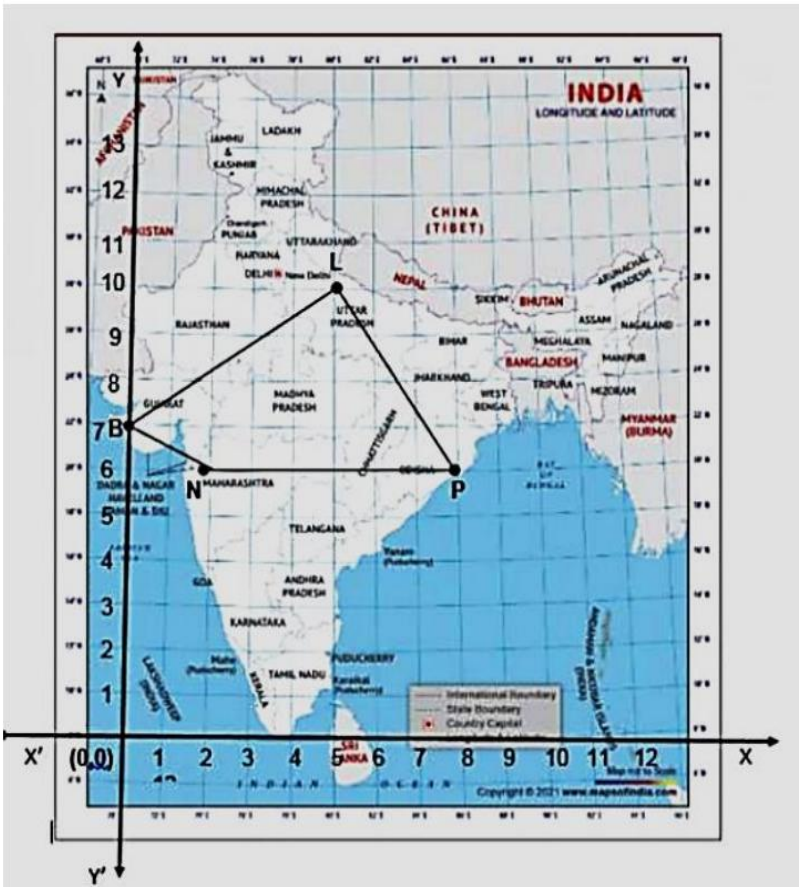
GENERAL INSTRUCTIONS:

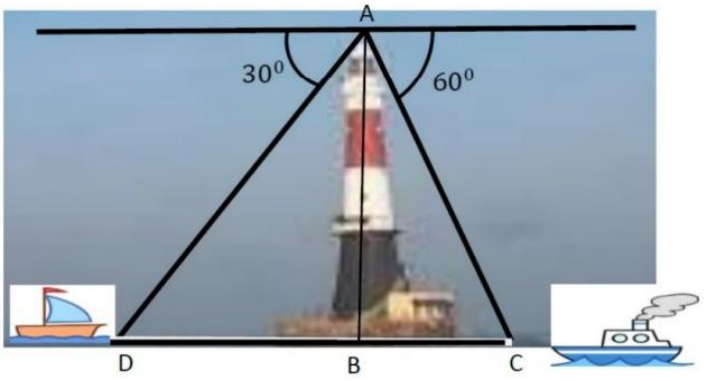
1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. 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 2marks questions of Section E.
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

	SECTION A	
SN	Section A consists of 20 questions of 1 mark each.	MARKS
1	The greatest possible length of the rope which can be used to measure two sticks of lengths 24 m and 18 m is A) 72 B) 12 C) 6 D) 3	1
2	Two positive integers 'a' and 'b' can be expressed as $a = x^3 y^2$ and $b = xy^3$, x and y are prime numbers . What is the L.C.M of a and b? (A) $x^3 y^2$ B) xy^3 C) $x^3 y^3$ D) xy^2	1
3	Write the discriminant of quadratic equation $(x+ 5)^2 = 2(5x – 3)$ A)124 B) -124 C) -24 D) 24	1
4	The value of x for which $2x$, $x + 10$, and $3x + 2$ are the three consecutive terms of an AP (A) -6 (B)18 (C)6 (D)-18	1
5	(sec A + tan A) (1 – sin A) = (A) sec A (B) sin A (C) cosec A (D) cos A	1
6	If one zero of the polynomial $f(x)= (k^2+4) x^2+13x+4k$ is the reciprocal of the other, k = (A) 2 (B)-2 (C)1 (D) -1	1
7	The distance of the point P(–6, 8) from the origin is (A) 10 units (B) 2√7 units (C) 8 units (D) 6 units	1
8	The fourth vertex D of a parallelogram ABCD whose three vertices are A(–2, 3), B(6, 7) and C(8, 3) is (A) (0, 1) (B) (0, –1) (C) (–1, 0) (D) (1, 0)	1
9	A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Length PQ is : (A) 12 cm (B) 13 cm (C) 8.5 cm (D) √119 cm	1
10	D and E are the midpoints of side AB and AC of a triangle ABC, respectively and BC = 6 cm. If DE || BC, then the length (in cm) of DE is: (A) 2.5 (B) 3 (C) 5 (D) 6	1
11	If triangles ABC and DEF are similar and AB=4 cm, DE=6 cm, EF=9 cm and FD=12 cm, the perimeter of triangle ABC is: (A) 22 cm (B) 20 cm (C) 21 cm (D) 18 cm	1
12	The co-ordinates of points A and B are (0,6) and (8,0) respectively. Then the co-ordinates of the centre of the circle whose diameter AB is:- (A) (8,6) (B) (6,8) (C) (4,3) (ans) (D) (0,0)	1
13	Which statement given below is true:- A) for any angle measure of A , Sin A is always greater than 1. B) for any angle measure of A , Cos A is always greater than 1.	1

	C) As the angle A grows sin A gets closer to 1 while cos A gets closer to 0 D) As the angle A grows sin A gets closer to 0 while cos A gets closer to 1	
14	The minute hand of a clock is 7 cm long. Find the area of the face of the clock described by minute hand in 30 minutes. (A)154 Sq cm (B)38.5 Sq cm (C)105 Sq cm (D)77 Sq cm	1
15	If the diameter of the sphere is doubled, the surface area of the resultant becomes x times that of the original one. Then the value of x is …….. (A) 2 (B) 3 (C) 4 (D) 5	1
16	Two identical solid cubes of side a are joined end to end. Then the total surface area of the resulting cuboid is (A) $12a^2$ (B) $10a^2$ (C) $8a^2$ (D) $11a^2$	1
17	The pair of equations y = 0 and y = –7 has: (A) one solution (B) two solutions (C) infinitely many solutions (D) no solution	1
18	If$\sqrt{3}$ sinθ-cosθ=0 and $0^0<\theta< 90^0$, then the value of θ is a)30^0 b)60^0 c)90^0 d)45^0	1
19	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 **Statement A (Assertion):** sin 45^0=cos 45^0 **Statement R(Reason) :** sin θ = cos θ for all values of θ. (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason(R) is false. (d) Assertion (A) is false but reason(R) is true.	1
20	**Statement A (Assertion):** If the HCF of two numbers is 5 and their product is 150, then their LCM is 30 **Statement R(Reason):**For any two positive integers p and q, HCF (p, q) × LCM (p, q) = p × q (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason(R) is false. (d) Assertion (A) is false but reason(R) is true.	1
	SECTION B	
	Section B consists of 5 questions of 2 marks each.	
21	If the sum of the zeroes of the quadratic polynomial $f(t) = kt^2 + 2t + 3k$ is equal to their product, find the value of k. OR If α and β are the zeros of the quadratic polynomial $2x^2 - 8x + 5$,find the value of $(\alpha+\frac{1}{\beta}) \times (\beta+\frac{1}{\alpha})$)	2
22	Prove that the length of tangents of a circle from an exterior point are equal.	2
23	D is a point on the side BC of a triangle ABC such that ∠ADC = ∠BAC. Show that $CA^2 = CB.CD$ OR In the figure, DE||OQ and DF||OR, show that EF||QR. 	2
24	If tan (A + B) = √3 and tan (A - B) = $\frac{1}{\sqrt{3}}$; 0°<A+B≤90°;A>B, find A and B.	2
25	The angle of depression of a car standing on the ground, from the top of a 85 m high tower is 45º. Find the distance of the car from the base of the tower.	2

	SECTION C	
	Section C consists of 6 questions of 3 marks each.	
26	Prove that $3 + 2\sqrt{5}$ is irrational.	3
27	A two digit number is obtained by either multiplying the sum of digits by 8 and then subtracting 5 or by multiplying the difference of digits by 16 and adding 3. Find the number. OR In a competitive examination , one mark is awarded for each correct answer, while $\frac{1}{2}$ mark is deducted for every wrong answer. Rahul answered 120 questions and got 90 marks. How many questions did he answer correctly?	3
28	A quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC	3
29	Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients	3
30	Prove the following identities, where the angles involved are acute angles for which the expressions are defined $\sqrt{\frac{1+sin\,A}{1-sin\,A}}$ = sec A + tan A OR $(cosecA - sinA)(secA - cosA) = \frac{1}{(tan\,A + cot\,A)}$	3
31	In Figure, XY and X′Y′ are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X′Y′ at B. Prove that ∠ AOB = 90° 	3
	SECTION D	
	Section D consists of 4 questions of 5 marks each.	
32	The altitude of a right triangle is 7 cm less than its base .If the hypotenuse is 13cm, find the other two sides. OR A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.	5
33	A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.	5
34	PQRS is a diameter of a circle of radius 6 cm. The lengths PQ, QR and RS are equal. Semicircles are drawn on PQ and QS as diameters as shown in below figure. Find the perimeter and area of the shaded region (Use π = 3.14) 	5
35	Sides AB and AC and median AD of a triangle ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Show that ΔABC ~ Δ PQR. OR State and prove Basic Proportionality Theorem	5
	SECTION E	
	Case study based questions are compulsory.	
36	India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.	

	Based on the above information, answer the following questions:  (i)Find the production during first year. (ii) Find the production during first 3 years. (iii). In which year, the production is Rs 29,200. OR (iii) Find the difference of the production during 7th year and 4th year.	1 1 2 2
37	In a GPS, the lines that run east-west are known as lines of latitude, and the lines running northsouth are known as lines of longitude. The latitude and the longitude of a place are its coordinates and the distance formula is used to find the distance between two places. The distance between two parallel lines is approximately 150 km. A family from Uttar Pradesh planned a round trip from Lucknow (L) to Puri (P) via Bhuj (B) and Nashik (N) as shown in the given figure below.  Based on the above information answer the following questions using co-ordinate geometry i) Find the distance between Lucknow to Bhuj ii) If Kota internally divides a line segment joining Lucknow to Bhuj in the ratio 3:2 then find the coordinates of Kota . iii) Name the type of Triangle formed by the places Lucknow Nashik and Puri OR Find a point on the longitude (y-axis) which is equidistant from the points Lucknow (L) and Puri (P).	1 1 2 2
38	A lighthouse is a tall tower with light near the top. These are often built on islands, coasts or on cliffs. Lighthouses on water surface act as a navigational aid to the mariners and send warning to boats and ships for dangers. Initially wood, coal would be used as illuminators. Gradually it was replaced by candles, lanterns, electric lights. Nowadays they are run by machines and remote monitoring. Prongs Reef lighthouse of Mumbai was constructed in 1874-75. It is approximately 40 meters high and its beam can be seen at a distance of 30 kilometres. A ship and a boat are coming towards the lighthouse from opposite directions. Angles of depression of flash light from the lighthouse to the boat and the ship are 30^0 and 60^0 respectively.	



(i) Find the distance of boat from the lighthouse?

(ii) Find the distance of ship from the lighthouse? 1

(iii) Find the time taken by the boat to reach the light house if it is moving at the rate of 2 km per hour. 1

OR

(ii) The ratio of the height of a light house and the length of its shadow on the ground is √3 : 1 . What is the angle of elevation of the sun? 2