

Roll No. : _____

Please check that this question paper contains 38 questions and 9 pages.

D.A.V. INSTITUTIONS, CHHATTISGARH
PRACTICE PAPER
CLASS: X
SUBJECT: MATHEMATICS (STANDARD)

TIME: 3 HOURS

MAX MARKS: 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 2 marks each.
4. Section C has 6 questions carrying 3 marks each.
5. Section D has 4 questions carrying 5 marks each.
6. 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.
7. All questions are compulsory. However, an internal choice of 2 questions of 5 marks, 2 questions 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.
8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

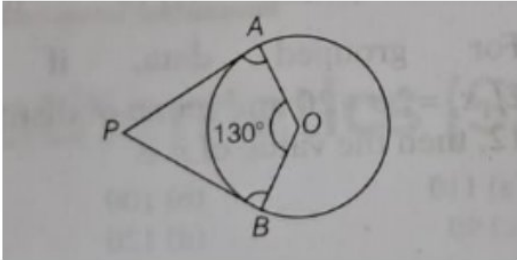
SECTION A

Section A consists of 20 questions of 1 mark each.

Q. No.		Marks
1	If $\sqrt{3} \tan \theta = 3 \sin \theta$. Then, the value of $\sin^2 \theta - \cos^2 \theta$ is (a) 3 (b) 1 (c) 1/3 (d) $\sqrt{3}$	1
2	If $\tan^2 45^\circ - \cos^2 30^\circ = x \sin 30^\circ \cos 30^\circ$, then the value of x is	1

	(a) 0	(b) 2	(c) 1	(d) -1	
3	If a pair of linear equations in two variables is consistent, then the lines represented by two equations are (a) perpendicular (b) coincident (c) neither coincident nor perpendicular (d) none of the above				1
4	If $x = 2$ and $x = 0$ are the zeroes of the polynomial $f(x) = 5x^2 + ax + b$. Then, the values of a and b are (a) $a = 2, b = 1$ (b) $a = 10, b = 1$ (c) $a = 1, b = 2$ (d) $a = -10, b = 0$				1
5	The value of k , for which one root of the quadratic equation $kx^2 - 14x + 8 = 0$ is six times the other, is (a) 0 (b) 1 (c) 2 (d) 3				1
6	The ratio in which the x -axis divides the line segment joining $A(3,6)$ and $B(12, -3)$ is (a) 1:2 (b) 2:1 (c) -2:1 (d) -1:2				1
7	The area of a sector of circle of radius 21 cm and central angle 90° is [take, $\pi = 22/7$] (a) 346.5 cm^2 (b) 340 cm^2 (c) 341.5 cm^2 (d) none of these				1
8	It is given that $\Delta ABC \sim \Delta DFE$, $\angle A = 50^\circ$, $\angle C = 30^\circ$, $AB = 10 \text{ cm}$, $AC = 15$ and $DF = 8 \text{ cm}$. Then, which of the following is true? (a) $DE = 12 \text{ cm}$ and $\angle F = 50^\circ$ (b) $DE = 12 \text{ cm}$ and $\angle F = 100^\circ$ (c) $EF = 12 \text{ cm}$ and $\angle D = 100^\circ$ (d) $EF = 12 \text{ cm}$ and $\angle D = 30^\circ$				1
9	The smallest number by which $\sqrt{27}$ should be multiplied, so as to get a rational number is (a) $\sqrt{27}$ (b) $3\sqrt{3}$ (c) $\sqrt{3}$ (d) 3				1
10	The tangents drawn at the extremities of the diameter of a circle are (a) parallel (b) perpendicular				1

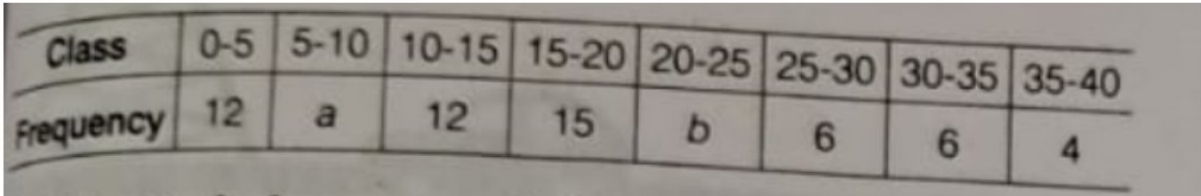
	(c) neither parallel nor perpendicular (d) none of the above	
11	Two poles of height 6 m and 11 m stand vertically upright on a plane ground. If the distance between their foot is 12 m, then the distance between their tops is (a) 14 m (b) 16 m (c) 13 m (d) 15 m	1
12	A toy is the shape of a cone over a hemisphere and the radius of the hemisphere is 3.5 cm. If the height of the toy is 15.5 cm, then the total area of the toy is (a) 214.5 cm ² (b) 215.4 cm ² (c) 216.5 cm ² (d) 210 cm ²	1
13	If the nth term of an AP is $3n - 8$, then its 16 th term is (a) 30 (b) 20 (c) 10 (d) 40	1
14	In an isosceles right angled triangle, if the hypotenuse is $5\sqrt{2}$ cm, then the length of the sides of triangle is (a) 4 cm (b) 6 cm (c) 5 cm (d) none of these	1
15	C is the midpoint of PQ, if P is (4, x), C is (y, -1) and Q is (-2, 4), then x and y respectively are (a) -6 and 1 (b) -6 and 2 (c) 6 and -1 (d) 6 and -2	1
16	The mean and the median of a distribution are 16 and 17, respectively. Then the value of mode is (a) 17 (b) 19 (c) 16 (d) 15	1
17	For grouped data, if $\sum fi = 20$, $\sum fixi = 2p + 20$ and mean of distribution is 12, then the value of p is (a) 110 (b) 100 (c) 90 (d) 120	1
18	The difference between the circumference and the radius of a circle is 37 cm. The area of the circle is (a) 149 cm ² (b) 154 cm ² (c) 121 cm ² (d) 169 cm ²	1
19	Directions In question number 19 and 20, a statement of assertion (A) is followed by a statement of reason (R). Choose the correct option. Assertion (A): Points (3, 2), (-2, -3) and (2, 3) form a right triangle	1

	<p>Reason (R): If (x, y) is equidistant from $(3, 6)$ and $(-3, 4)$, then $3x + y = 5$.</p> <p>a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).</p> <p>b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).</p> <p>c) Assertion (A) is true but Reason (R) is false.</p> <p>d) Assertion (A) is false but Reason (R) is true.</p>	
20	<p>Assertion (A): 2 is a rational number.</p> <p>Reason (R): The square roots of all positive integers are irrationals.</p> <p>a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).</p> <p>b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).</p> <p>c) Assertion (A) is true but Reason (R) is false.</p> <p>d) Assertion (A) is false but Reason (R) is true.</p>	1
SECTION B		
Section B consists of 5 questions of 2 marks each.		
21	<p>If two tangents inclined at an angle of 50° are drawn to a circle of radius 5 cm then, find the length of each tangent.</p> <p style="text-align: center;">OR</p> <p>In the given figure, if the angle between the two radii of a circle is 130°, then find the angle between the tangent at the ends of the radii.</p> <div style="text-align: center;">  </div>	2
22	<p>In a right-angled ΔABC, right-angled at B, if the ratio of AB to AC is $1 : \sqrt{2}$, then find the values of</p> <p>(i) $2 \tan A / (1 - \tan^2 A)$</p>	2

	(ii) $2 \tan A / (1 + \tan^2 A)$	
23	If $\Delta ABC \sim \Delta PQR$, $AB = 6.5$ cm. $PQ = 10.4$ cm and perimeter of that $\Delta ABC = 60 \text{ cm}^2$, then find the perimeter of that ΔPQR .	2
24	Find the value of k for a given equation that has real and equal roots. $kx^2 - 5x + k = 0$	2
25	Find the sum of the series $7 + 10\frac{1}{2} + 14 + \dots + 84$.	2
	OR	
	Sarita saved Rs. 5 in the first week of the year and then increased her weekly savings by Rs. 1.75 each week. In which week will her weekly savings be Rs. 20.75?	
	SECTION C	
	Section C consists of 6 questions of 3 marks each.	
26	A bicycle wheel makes 5000 revolutions in 11 km. Find the diameter of the wheel.	3
	OR	
	If the perimeter of the semi-circular protractor is 108 cm. Find the diameter of the protractor. [take, $\pi = 22/7$]	
27	If from an external point B of a circle with centre O , two tangents BC and BD are drawn such that $\angle DBC = 120^\circ$, prove that $BC + BD = BO$ i.e. $BO = 2 BC$.	3
28	The polynomial $x^2 - (k+6)x + 2(2k-1)$ has the sum of its zeroes equal to half of their product. Find the value of k .	3
29	If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes $\frac{1}{2}$ if we only add 1 to the denominator. What is the fraction ?	3
30	Find the value of $5 \sin^2 30^\circ + \cos^2 45^\circ - 4 \tan^2 30^\circ / 2 \sin^2 30^\circ \cos 30^\circ + \tan 45^\circ$	3
	OR	
	Given, $\cos \theta = 21/29$, determine the value of $\sec \theta / \tan \theta - \sin \theta$.	
31	Find the points on the x -axis, which are at a distance of $2\sqrt{5}$ from the point $(7, -4)$. How many such points are there?	3

SECTION D

Section D consists of 4 questions of 5 marks each.

32	A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, then find the value of length of her shadow after 4s.	5
33	The median of the following data is 16. Find the missing frequencies a and b, if the total of the frequencies is 70. 	5
34	Find the sum of the first 51 terms of an AP whose second and third terms are 14 and 18, respectively. <p style="text-align: center;">OR</p> If the sum of the first 7 terms of an AP is 49 and that of 17 terms is 289. Find the sum of first n terms.	5
35	A wooden article was made by scooping out a hemisphere from one end of a cylinder and cone from the other end as shown in the figure. If the height of the cylinder is 40 cm, radius of the cylinder is 7 cm and height of the cone is 24 cm.	5