

SUMMATIVE ASSESSMENT – II
MATHEMATICS
Class – X

Time allowed : 3 hours

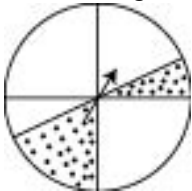
Maximum Marks : 90

General Instructions :

- (i) All questions are **compulsory**.
- (ii) The question paper consists of **31** questions divided into four **sections A, B, C and D**. **Section-A** comprises of **4** questions of **1 mark** each, **Section-B** comprises of **6** questions of **2 marks** each, **Section-C** comprises of **10** questions of **3 marks** each and **Section-D** comprises of **11** questions of **4 marks** each.
- (iii) There is no overall choice.
- (iv) Use of calculator is not permitted.

SECTION-A


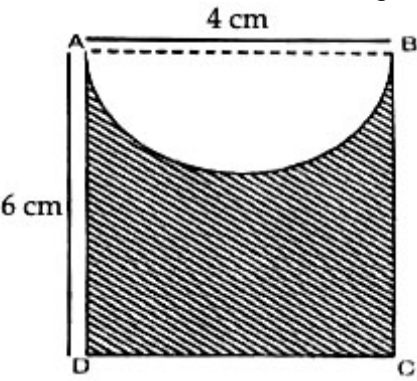
Question numbers **1 to 4** carry **one** mark each.

1	Find the 19 th term of the following sequence : $t_n = \begin{cases} n^2, & \text{where } n \text{ is even} \\ n^2 - 1, & \text{where } n \text{ is odd} \end{cases}$	1
2	A pole of light is 50 m high from which angle of depression of a ship is 30°. Find the distance of the ship from the pole.	1
3	A spinner shown here is rotated once. What is the probability that the arrow will stop at the shaded region ? 	1
4	Determine the vertex which contains a right angle in ΔABC , where A (4, -2), B (7, 9) and C (7, -2)	1

SECTION-B

Question numbers **5 to 10** carry **two** marks each.

5	One day, I asked the son of my close friend about his age. The child replied in a different way : He said, " One year ago, my dad was 8 times as old as me and now his age (in years) is equal to the square of my age ". Represent the above situation in the form of a quadratic equation.	2
6	How many multiples of 4 lie between 10 and 260 ?	2
7	PQ and PR are two tangents drawn from an external point P to a circle with centre O. Prove that OORP is a cyclic quadrilateral.	2

8	Two circles touch internally at P. How many tangents can be drawn to the circles from an external point ? What is the relation between the tangents ?	2
9	Draw a circle of radius 3.5 cm. From a point 6 cm away from its centre, Construct two tangents to the circle.	2
10	If the radii of the circular bases of a frustum of a cone are 33cm and 27 cm and its slant height is 10cm, find the height of the frustum.	2
		
Question numbers 11 to 20 carry 3 marks each.		
11	If the quadratic equation $(1 + a^2)b^2x^2 + 2abcx + (c^2 - m^2) = 0$ in x has equal roots, prove that $c^2 = m^2(1 + a^2)$.	3
12	If the 19 th term of an AP is 47, then find the sum of the first 37 terms.	3
13	ABC is a triangle. A circle touches sides AB and AC produced and side BC at X, Y and Z respectively. Show that $AX = \frac{1}{2}$ Perimeter of ΔABC .	3
14	A tree 12 m high, is broken by the wind in such a way that its top touches the ground and makes an angle 60° with the ground. At what height from the bottom the tree is broken by the wind ?	3
15	How many times do you expect to get 6 when a die is thrown 60 times ?	3
16	Find the value of k, if the point P(1, 3) is equidistant from the points A(k, 7) and B(-9, k).	3
17	The line segment joining the points (3, 6) and (9, -3) is trisected at the points P and Q. If P lies on the line $3x - 2y - k = 0$, find the value of k.	3
18	Find the area of the shaded region in the given figure 	3
19	Four hollow cubical boxes each having outer edge 1 m are joined to form a double bed in which top face is a square. If the wood used is of thickness 5 cm and all the four boxes can be opened, then what is the capacity of the boxes of the double bed in cubic metres ?	3
20	A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding minor segment. (Use $\pi = 3.14$)	3

21	Solve : $\frac{2y}{y-4} + \frac{2y-5}{y-3} = \frac{25}{3}$; $y \neq 3, 4$.	4
22	Find the sum of all natural numbers amongst first one thousand numbers which are neither divisible by 2 nor by 5.	4
23	Find the roots of the quadratic equation $4x^2 + 4bx - (a^2 - b^2) = 0$ by the method of completing the square.	4
24	AC is a chord of a circle with centre O. The tangents at C to the circle meets extended diameter AB at D. Show that $BD = BC$, if $\angle D = \angle A$.	4
25	Construct a ΔABC whose sides are in the ratio 2 : 3 : 4 and perimeter 12 cm. Now construct $\Delta A'BC'$ similar to ΔABC such that $A'B = \frac{2}{5} AB$.	4
26	There are two temples, one on each bank of a river, just opposite to each other. One temple is 50 m high. From the top of this temple, the angles of depression of the top and the foot of the other temple are 30° and 60° respectively. Find the width of the river and the height of the other temple.	4
27	Card marked with numbers 1, 3, 5, - - - - - 103, are put in a box and mixed thoroughly. A card is drawn at random from the box. Find the probability that the number on the drawn card is : (i) at least 87 (ii) less than 23	4
28	The co-ordinates of the vertices of a quadrilateral ABCD are A (0, 5), B (-2, -2), C(5, 0) and D(7, 7). Prove that the quadrilateral ABCD is a rhombus.	4
29	Mrs. Rajani has a garden in the shape of an equilateral triangle. She divided it into four parts by drawing three circular parts at the vertices of the triangle with radii each equal to the half of side of triangle for growing vegetables and flowers using Bio fertilizers. The area of the triangle is $144\sqrt{3} \text{ m}^2$. Find the area of part of the triangle not included in the circular parts. How Bio fertilizers are helpful over chemical fertilizers ?	4
30	A plot is in the form of a rectangle ABCD having a semicircle on BC. If $AB = 60 \text{ m}$ and $BC = 28 \text{ m}$, find the area and perimeter of the plot.	4
31	A cone, a hemisphere and a cylinder stand on equal bases and have same heights as the radii of the bases. Show that their volumes are in the ratio 1 : 2 : 3.	4
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