Class: IX   Sub: MATHEMATICS   Max Marks: 30
                                                                              Time:1 hour

General Instructions:

1. This question paper has 5 sections- A - D.
2. Section A- PART-1 (MCQ) comprises of 6 questions of 1 mark each.
3. Section A- PART-2 (Assertion and Reason) comprises of 1 question of 1 mark each.
4. *Section B comprises of 3 questions of 2markS each.*
5. Section C comprises of 3 questions of 3 marks each.
6. Section D comprises of 2 Case based integrated units of assessment (4 marks each) with sub-parts of the values 2, 1 and 1 marks each respectively.
7. All questions are compulsory. However, an internal choice in 1 Q of 2 marks, 1 Q of 3 marks has been provided. An internal choice has been provided in the 2 marks questions of section D.

Section A

PART-1(MCQ-1 mark each)

Q.1.	The value of $\sqrt[4]{(2401)^{-1}}$ is:							
	A	$\frac{1}{7}$	**B**	$\frac{1}{8}$	**C**	$\frac{1}{6}$	**D**	7

Q.2.	The length of the sides of a triangle are 34cm, 42cm and 20cm. If the area of the triangle is 336 cm², then the length of perpendicular from the opposite vertex to the side whose length is 42cm, is equal to_____.							
	A	$15\ cm$	**B**	$16\ cm$	**C**	$48\ cm$	**D**	$96\ cm$

Q.3.	The decimal number $0.8\overline{33}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$ is:							
	A	$\frac{5}{6}$	**B**	$\frac{6}{5}$	**C**	$\frac{6}{7}$	**D**	$\frac{1}{7}$

Q.4.	The area of an equilateral triangle is $16\sqrt{3}\ cm^2$. The perimeter of the triangle (in cm) is:							
	A	$42\ cm$	**B**	$18\ cm$	**C**	$32\ cm$	**D**	$24\ cm$

Q.5.	The simplest rationalizing factor of $\frac{1}{\sqrt{108}}$ is _____.							
	A	$\sqrt{2}$	**B**	$\sqrt{3}$	**C**	$\frac{1}{\sqrt{3}}$	**D**	$6\sqrt{3}$

Q.6.	The side of a triangle are in the ratio 25:14:12 and its perimeter is 510m. The greatest side of the triangle is:						
	A	120m	**B**	170m	**C**	250m	**D**	270m

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Section A
PART-2 ASSERTION AND REASON TYPE QUESTIONS (1 mark each)

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DIRECTION: 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 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.

Q.7. Assertion(A): Area of an equilateral triangle whose side is 6cm each will be $9\sqrt{5}$ cm^2.

Reason(R): Area of an equilateral triangle $= \dfrac{\sqrt{3}}{4}a^2$.

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Section B (2 marks each)

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Q.8. Represent $\sqrt{17}$ on the number line.

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(OR)

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Simplify $\sqrt{108} + 4\sqrt{2} - \sqrt{72} - 5\sqrt{3} + \sqrt{8}$.

Q.9. Find the area of a triangle whose sides are 32 cm, 54 cm and 61 cm.

Q.10. The measure of each side of an equilateral triangle is 12cm. Calculate its area.

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Section C (3 marks each)

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Q.11. The perimeter of an isosceles triangle is 32cm. The ratio of the equal side to its base is 3:2. Find the area of the triangle.

Q.12. If $x = \sqrt{11} - 2\sqrt{3}$, then what is the value of $x + \dfrac{1}{x}$.

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(OR)

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Find three rational and irrational numbers between $\dfrac{5}{11}$ and $\dfrac{9}{11}$.

Q.13. If $\dfrac{3-\sqrt{6}}{3+2\sqrt{6}} = a\sqrt{6} - b$, then find the values of a and b.

	Section D
	(CASE STUDY BASED QUESTIONS – 4 MARKS EACH)
Q.14.	CASE STUDY BASED-I

Dev is fond of decorating walls with frames. During vacation he decides to decorate his room walls with many beautiful frames of sceneries in various shapes. One of his friends visited his house and was impressed to see few triangular sceneries there. The dimensions of each triangular frame are 40 cm, 60 cm and 60 cm.

Based on the above information answer the following questions:

    (i)   What is the total length of each frame of scenery?   (1m)

    (ii)   If the area of an equilateral triangle is $36\sqrt{3}\ m^2$, find the length of each side of the triangle.   (1m)

    (iii)   Find the area of the wall covered by two triangular scenery frames.   (2m)

                        OR

           Find the area of the wall covered by all four triangular scenery frames?   (2m)

Q.15. CASE STUDY BASED-II

Two class mates Maya and Amal simplified two different expressions during the revision hour and explained to each other their simplifications. Maya explains the simplification of $\frac{1}{8+5\sqrt{2}}$ by rationalizing the denominator and Amal explains the simplification of $(2\sqrt{2}+3\sqrt{3})^2$ using an identity.

Based on the above information answer the following questions:

(i) Which identity is used by Amal to solve $(2\sqrt{2}+3\sqrt{3})^2$.   (1m)

(ii) Simplify: $(2\sqrt{2}+3\sqrt{3})^2$.   (2 m)

(OR)

    Write the decimal number $0.3\overline{8}$ in the form of $\frac{p}{q}$, where p and q are integers and $q\neq 0$.

    (2 m)

(iii) What is the rationalizing factor of $\frac{1}{8+5\sqrt{2}}$?   (1 m)

				ANSWERS				
	Q.1	A	**Q.2**	B	**Q.3**	A	**Q.4**	D
	Q.5	B	**Q.6**	C	**Q.7**	d	**Q.8**	No. line (OR) $\sqrt{3}$
	Q.9	$420\sqrt{5}cm^2$	**Q.10**	$36\sqrt{3}\ cm^2$	**Q.11**	$32\sqrt{2}\ cm^2$	**Q.12**	$4\sqrt{3}$ (OR) Rational no.- 52/110, 63/110, 78/110… Irrational no.- 0.480480048000…, 0.505005000…, 0.515115111…
	Q.13	$a = \dfrac{3}{5}, b = \dfrac{7}{5}$	**Q.14**	(i) 160cm (ii) 12m iii) $1600\sqrt{2}cm^2$ (OR) $3200\sqrt{2}cm^2$	**Q.15**	(i) $\left(\sqrt{a} + \sqrt{b}\right)^2$ $= a + 2\sqrt{a}\sqrt{b} + b$ (ii) $35 + 12\sqrt{6}$ (OR) $\dfrac{7}{18}$ (iii) $8 - 5\sqrt{2}$		

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