MATHEMATICS
WORKSHEET_150323
CHAPTER 01 NUMBER SYSTEM

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : IX **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.

(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.

(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

(iv). There is no overall choice.

(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. On simplifying $(\sqrt{3}-\sqrt{7})^2$, we get

(a) $2-\sqrt{21}$ (b) $5-\sqrt{21}$ (c) $2(5-\sqrt{21})$ (d) $10-\sqrt{21}$

2. The value of $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$ is equal to

(a) $\sqrt{2}$ (b) 2 (c) 4 (d) 8

3. The simplified form of $13^{\frac{1}{5}} \div 13^{\frac{1}{3}}$ is

(a) $13^{\frac{2}{15}}$ (b) $13^{\frac{8}{15}}$ (c) $13^{\frac{-1}{15}}$ (d) $13^{\frac{-2}{15}}$

4. On dividing $6\sqrt{27}$ by $2\sqrt{3}$, we get

(a) $3\sqrt{9}$ (b) 6 (c) 9 (d) none of these

5. The value of √10 times √15 is equal to

(a) 5√6 (b) √25 (c) 10√5 (d) √5

6. Value of $(256)^{0.16} \times (256)^{0.09}$ is

(a) 4 (b) 16 (c) 64 (d) 256.25

7. $\left(-\frac{1}{27}\right)^{\frac{-2}{3}}$ is equal to

(a) $8\left(\frac{1}{27}\right)^{\frac{-2}{3}}$ (b) 9 (c) $\frac{1}{9}$ (d) $27\sqrt{27}$

8. Value of $\sqrt[4]{(81)^{-2}}$ is

(a) $\frac{1}{9}$ (b) $\frac{1}{3}$ (c) 9 (d) $\frac{1}{81}$

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** Rational number lying between two rational numbers x and y is $\frac{1}{2}(x + y)$.

Reason (R): There is one rational number lying between any two rational numbers.

10. **Assertion (A):** $2 + \sqrt{3}$ is an irrational number.
Reason (R): Sum of a rational number and an irrational numbers is always an irrational number.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Find the value of x for which $\left(\frac{3}{4}\right)^6 \times \left(\frac{16}{9}\right)^5 = \left(\frac{4}{3}\right)^{x+2}$.

12. Simplify $\sqrt[4]{81} - 8(\sqrt[3]{216}) + 15(\sqrt[5]{32}) + \sqrt{225}$.

13. Simplify $\frac{6-4\sqrt{3}}{6+4\sqrt{3}}$ by rationalising the denominator.

14. Represent $\sqrt{2}$ on the real number line.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Find the value of $\frac{4}{(216)^{-\frac{2}{3}}} + \frac{1}{(256)^{-\frac{3}{4}}} + \frac{2}{(243)^{-\frac{1}{5}}}$

16. Find the value of a and b, if $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$

17. Simplify $\frac{4+\sqrt{5}}{4-\sqrt{5}} + \frac{4-\sqrt{5}}{4+\sqrt{5}}$ by using rationalizing the denominator

SECTION – D

Questions 18 carry 5 marks each.

18. Prove that $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$.

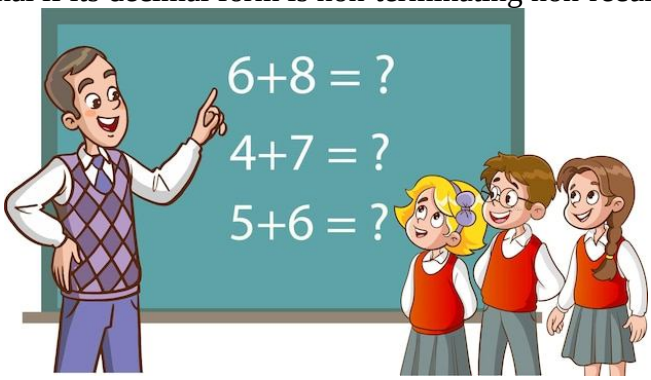
SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Mr. Kumar, a Mathematics teacher explained some key points of unit 1 of class IX to his students. Some are given here.

- There are infinite rational numbers between any two rational numbers.

- Rationalisation of a denominator means to change the irrational denominator to rational form.
- A number is irrational if its decimal form is non-terminating non-recurring



On the basis of these key points, Answer the following questions

(a) What is the reciprocal of $2 + \sqrt{3}$?

(b) Find a rational number between $\sqrt{2}$ and $\sqrt{3}$

(c) Simplify $(\sqrt{3} - \sqrt{7})^3$

OR

(c) Express $\frac{4}{7}$ in decimal form and state the kind of decimal expansion.

20. In January 2021, the vaccination drive for COVID -19 started in 7 states of a country. More than 60% of the people were vaccinated in 4 states out of 7 states, In one of the state vaccination drive has not been started due to flood although vaccine dose was supplied to that state in advance. In February 2021, 4 more states were included in this drive and 2 states have got remarkable response from the people and more than 80% of the population got vaccinated there. Using this information answer the following questions:

(a) In January 2021, more than 60% of people were vaccinated in 4 states out of 7 states. Find the decimal representation of $\frac{4}{7}$ (2)

(b) In 2 states out of 11 states, more than 80% of people participated in vaccination drive in two months. Find the decimal form of $\frac{2}{11}$ (2)

OR

(b) The fraction for state where vaccination not started in January 2021 is $\frac{1}{7}$ and its decimal form is $0.\overline{142857}$. Find the decimal form of $\frac{6}{7}$. (2)