Remember & Understanding Based Questions

Ques.1) If $5000 > x^4$ then the greatest possible integer value of x is _____.
a) 5   b) 6   c) 8   d) 7

Ques.2) Simplify: $\left(\frac{512}{125}\right)^{\frac{2}{3}} \div \left(\frac{64}{125}\right)^{\frac{1}{3}} \times \left(\frac{125}{8}\right)^{\frac{2}{3}}$

a) 45   b) 20   c) 40   d) 25

Ques.3) When we have to add numbers in standard form, we convert them into numbers with the _____ exponents.
a) Not equal   b) Different   c) Same   d) Negative

Ques.4) For a fixed base, if the exponent decreases by 1, the number becomes
a) Ten times of the previous number   b) Hundredth of the previous number
c) Hundredth times of the previous number   d) One - tenth of the previous number

Ques.5) Expand 1025.63 using exponents.
a) $1 \times 10^3 + 0 \times 10^1 + 5 \times 10^0 + 6 \times 10^{-1} + 3 \times 10^{-3}$
b) $1 \times 10^3 + 0 \times 10^2 + 2 \times 10^1 + 5 \times 10^0 + 6 \times 10^{-1} + 3 \times 10^{-2}$
c) $1 \times 10^3 + 0 \times 10^2 + 2 \times 10^1 + 5 \times 10^0 + 6 \times 10^{-1} + 3 \times 10^{-3}$
d) $1 \times 10^4 + 0 \times 10^3 + 2 \times 10^2 + 5 \times 10^1 + 6 \times 10^0 + 3 \times 10^{-1}$

Ques.6) Simplify: $\left[\left\{\left(\frac{-1}{5}\right)^{-2}\right\}^2\right]^{-1}$

a) $\frac{5}{625}$ b) $\frac{1}{652}$ c) $\frac{1}{625}$ d) $\frac{-1}{625}$

Ques.7) If x be any integer different from zero and m be any positive integer, then x^{-m} is equal to

a) $\frac{1}{x^m}$ b) $\frac{-1}{x^m}$ c) x^m d) $- x^m$

Ques.8) The length of a room is 9.0085×10^{-2} cm. Which number is equivalent to this length?
a) 0.90085 cms   b) 0.090085 cms   c) 900.85 cms   d) 9008.5 cms

Ques.9) The human body has about 100 billion cells. This number can be written in exponential form as
a) 10^9 b) 10^{-11} c) 10^{-9} d) 10^{11}

Ques.10) The standard form for 234000000 is
a) 0.234×10^{-9} b) 2.34×10^8 c) 2.34×10^{-8} d) 0.234×10^9

Ques.11) The number 4325×10^{-4} written in standard form is
a) 432.5×10^{-3} b) 0.4325   c) 4.325×10^{-1} d) 43.25×10^{-2}

Ques.12) Very small numbers can be expressed in standard form using _____ exponents.
a) Equal   b) Different   c) Negative   d) Positive

Ques.13) The least integer value of a which satisfies $a^4 > 2400$ is _____.
a) 8   b) 7   c) 6   d) 5

Ques.14) Which one among the following statements is true?
a) $4^6 > 6^4$ b) $3^6 < 6^3$ c) $21^2 < 12^3$ d) $6^5 > 5^6$

Ques.15) Find the value of $(2^{-1} + 3^{-1})^2$.

Ques.16) Find the value of $\left(\frac{2}{3}\right)^{-2}$

Ques.17) Express the product of 3.2×10^6 and 4.1×10^{-1} in the standard form.

Ques.18) State True & False

1. Reciprocal of x^{-a} is x^a .

2. The multiplicative inverse of $(-4)^2$ is $(4)^2$.

3. Exponent is the number of times a number is multiplied by itself.

4. The multiplicative inverse of $\left(\frac{3}{2}\right)^2$ is not equal to $\left(\frac{2}{3}\right)^{-2}$

5. Large numbers can be expressed in the standard form by using positive exponents.

6. The standard form of 0.0034 is 3.4×10^{-3} .

Ques.19) Fill in the Blanks.

1. The value of 3×10^{-7} is equal to _____ .

2. $\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2} = $ _____ .

3. 0.000003 is equal to _____ $\times 10^{-6}$.

4. The usual form of 2.39461×10^6 is _____ .

5. Sum of mass of earth and moon = 5.97×11^{24} kg + 7.35×110^{22} kg = _____ $\times 10^{22}$ kg

Analytical Based Questions

Ques.1) Assertion(A): The value of $\frac{(57^0 \times 18^0 \times 7^{-1})}{(6^0 \times 7^{-2})}$ is $\frac{1}{7}$.

Reason(R): If a is a rational number, then $a^0 = 1$.
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.

Ques.2) Assertion(A): The value of $\frac{\left[(5^5)^2 \times 5^7\right]}{5^3} = 5^{14}$.

Reason(R): Exponential form is a short method to show how many times a number is multiplied to itself.
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.

Ques.3) Assertion (A): The reciprocal of $\left(\frac{-1}{3}\right)^{-2}$ is 3^{-2} .

Reason (R): A fractional exponent of the form $\frac{1}{n}$ means to take n^{th} root.
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.

Ques.4) Assertion (A): 4^{-2} can be written as $\left(\frac{1}{4}\right)^2$.

Reason (R): For any number a, Reciprocal of $a^m = a^{-m} = \left(\frac{1}{a^m}\right)$.

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.

Ques.5) Assertion (A): The value of $\left(\frac{-3}{13}\right)^4 \times (3)^{-4}$ is $\left(\frac{-1}{13}\right)^4$.

Reason (R): If a and b are rational numbers and m is a whole number,then $a^m \times b^m = (ab)^m$.

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.

Ques.6) Assertion (A): In 2020. The population of a country was about 1468000000. Its standard form is 1.468 $\times 10^8$.

Reason (R): Scientific notation is also known as Standard form.

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.

Ques.7) Assertion (A): The expanded form of 5×10^{-9} is 0.000000005.

Reason (R): For any number 'a', $a^{-m} = \frac{1}{a^m}$.

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.

Ques.8) Assertion (A): Charge of an electron is 0.0000000000000000016 coulombs. Its standard form is 1.6×10^{-18} coulombs.

Reason (R): To convert small number to scientific notation move the decimal to the right till you get to the right of first non zero integer. Now, write the number of places the decimal point moved right as negative power of base 10.

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.

Ques.9) Assertion (A): On comparing $(-1)^{45}$ and $(-1)^{44}$, $(-1)^{45}$ is bigger.

Reason (R): (- negative number)^{evennumber} is positive and (- negative number)^{oddnumber} is negative.

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.

Ques.10) Assertion (A): On comparing 2.5×10^{12} and 2.5×10^8 ; We find that 2.5×10^{12} is bigger.

Reason (R): If two numbers have common base then we simply compare their exponents.

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.

Ques.11) Assertion (A): On comparing 8^3 and 4^4, 8^3 is greater.

Reason (R): 64 as a power of 4 can be expressed as 4^3 .

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.

Ques.12) A group of students were given the assignment to collect different types of leaves. The group collected 343 types of leaves. Represent the number of leaves collected in the form of exponential expression with its base being indivisible.

a) 7^2 b) 7^3 c) 7   d) 7^4

Ques.13) Match the Column.

Column-I	Column-II
(P) $\left[\left(5^3\right)^2 \times 5^5\right] \div 5^9$	(i) $(-6)^3$
(Q) $(-6)^5 \div (6)^2$	(ii) 5
(R) $(1^0 + 2^0 + 3^0) \times 10^0 + 5^0 \left(\frac{4^0+6^0}{2}\right)$	(iii) $\frac{-1}{3^2}$
(S) $\frac{-1}{3^{12}} \div \frac{-1}{9^5}$	(iv) 25

Match the following.

a) (P)→ (i), (Q) → (ii), (R) → (iii), (S) → (iv)   b) (P)→ (iv), (Q) → (i), (R) → (ii), (S) → (iii)

c) (P)→ (ii), (Q) → (iii), (R) → (iv), (S) → (i)   d) (P)→ (iv), (Q) → (ii), (R) → (i), (S) → (iii)

Ques.14) Match the Column.

Column A	Column B
1. $a^m \times a^n$	(a) a^{m-n}
2. $(a^m)^n$	(b) a^{m+n}
3. $\frac{a^m}{a^n}$	(c) $\frac{a^n}{b^n}$
4. $\left(\frac{a}{b}\right)^n$	(d) a^{mn}

Ques.15) Match the Column.

Column A	Column B
a. Reciprocal of $(-3)^2$	p. 9
b. Reciprocal of $(-3)^{-2}$	q. $\frac{9}{4}$
c. Reciprocal of $\left(\frac{-2}{3}\right)^2$	r. $\frac{4}{9}$
d. Reciprocal of $\left(\frac{-2}{3}\right)^{-2}$	s. $\frac{1}{9}$

Ques.16) If $\frac{5^m \times 5^3 \times 5^{-2}}{5^{-5}} = 5^{12}$, then find m.

Ques.17) Find x, if $6^{2x} \div 6^{-4} = 36$.

Ques.18) About 230 billion litres of water flows through a river each day, how many litres of water flows through that river in a week? How many litres of water flows through the river in a year? Write your answer in standard notation.

Ques.19) The major components of human blood are red blood cells, white blood cells, platelets and plasma. A typical red blood cell has a diameter of approximately 7×10^{-6} metres. A typical platelet has a diameter of approximately 2.33×10^{-6} metre. Which has a greater diameter, a red blood cell or a platelet?

Ques.20) Simplify : $\frac{25 \times t^{-4}}{5^{-3} \times 10 \times t^{-8}} (t \neq 0)$

Ques.21) If possible, find a hook - up of prime base number machine that will do the same work as the given stretching machine. Do not use ($\times$ 1) machines.

(a)   (b)   (c)   (d)
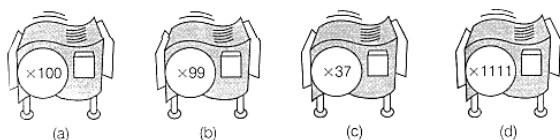
Question No. 21 to 24 are based on the given text. Read the text carefully and answer the questions:

Let us see how to express the decimal numbers in expanded form.

For example we take number 3425.365

$3425.465 = (3 \times 1000) + (4 \times 100) + (2 \times 10) + (5 \times 1)$

$+ \dfrac{4}{10} + \dfrac{6}{100} + \dfrac{5}{1000}$

$= 3 \times 10^3 + 4 \times 10^2 + 2 \times 10^1 + 5 \times 10^0 + 4 \times 10^{-1} + 6 \times 10^{-2} + 5 \times 10^{-3}$

We observe that the power of 10 starts from 3 and ends at - 3

The coefficients of 10^3, 10^2 and 10^1 etc are 3, 4 and 2

$$10^{-1} = \frac{1}{10} , \quad 10^{-2} = \frac{1}{10^2} = \frac{1}{100}$$

Example 2:

$0.0003265 = \dfrac{3}{10000} + \dfrac{2}{100000} + \dfrac{6}{1000000} + \dfrac{5}{10000000}$

$= 3 \times 10^{-4} + 2 \times 10^{-5} + 6 \times 10^{-6} + 5 \times 10^{-7}$

Here the power of 10 starts from - 4 and ends at - 7.

Ques.21) In the expansion of 2.3456 the smallest power of 10 will be?
a) 5   b) - 4   c) - 3   d) 4

Ques.22) In the expansion of 645.3456, the largest power of 10 will be?
a) - 3   b) 3   c) 4   d) - 4

Ques.23) In the expansion of 32512.34567 the coefficient 10^3 will be?
a) 1   b) 3   c) 2   d) 5

Ques.24) In the expansion of 345.23546 the power of 10 starts from _____ and ends at _____.