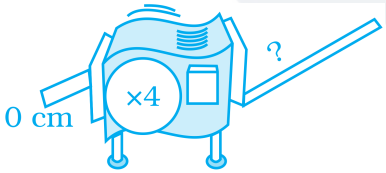
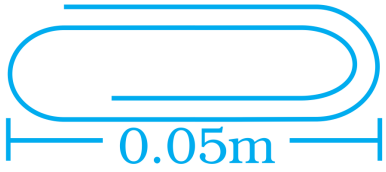
[90]

*** Questions With Calculation.[2 Marks Each]**

1. Simplify: $\left\{\left(\frac{1}{3}\right)^{-2}-\left(\frac{1}{2}\right)^{-3}\right\}\div\left(\frac{1}{4}\right)^{-2}$
2. Simplify: $\left(\frac{5}{8}\right)^{-7}\times\left(\frac{8}{5}\right)^{-5}$
3. Express 0.00000000000942 in standard form.
4. Express the 6020000000000000 in standard form.
5. Express 3×10^{-8} in usual form.
6. Express 1.0001×10^{9} in usual form.
7. Express the number appearing in the statement in standard form :Charge of an electron is 0.00000000000000000016 coulomb.
8. Evaluate :$\left\{\left(\frac{1}{3}\right)^{-1}-\left(\frac{1}{4}\right)^{-1}\right\}^{-1}$
9. Find the value of m for which $5^{m}\div5^{-3}=5^{5}$
10. Simplify and express the result in power notation with positive exponent: $(3^{-7}\div3^{-10})\times3^{-5}$
11. Simplify and express the result in power notation with positive exponent.$(-4)^{5}\div(-4)^{8}$
12. Express $\frac{27}{64}$ and $\frac{-27}{64}$ as powers of a rational number.
13. Simplify:
    $\left(\frac{1}{2}\right)^{2}-\left(\frac{1}{4}\right)^{3-1}\times2^{-3}$
14. Express the following in standard form:
    Mass of a molecule of hydrogen gas is about 0.000000000000000000000334 tons.
15. **Stretching Machine:**
    Suppose you have a stretching machine which could stretch almost anything. For example, if you put a 5 metre stick into a (×4) stretching machine (as shown below), you get a 20 metre stick. Now if you put 10cm carrot into a (×4) machine, how long will it be when it comes out?



16. Some migratory birds travel as much as 15,000km to escape the extreme climatic conditions at home. Write the distance in metres using scientific notation.
17. A particular star is at a distance of about 8.1×10^{13}km from the Earth. Assuring that light travels at 3×10^{8}m per second, find how long does light takes from that star to reach the Earth.
18. The paper clip below has the indicated length. What is the length in standard form.

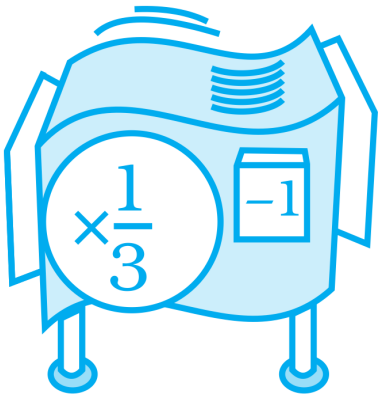


    Length of the paper clip = 0.05m.
    In standard form, 0.05m = 0.5 x 10^{-1} = 5.0 x 10^{-2}m.
    Hence, the length of the paper clip in standard form is 5.0 x 10^{-2}m.
19. Mass of Mars is 6.42×10^{29}kg and mass of the Sun is 1.99×10^{30}kg. What is the total mass?
20. Express $\frac{1.5\times10^{6}}{2.5\times10^{-4}}$ in the standard form.
21. By what number should $(-8)^{-3}$ be multiplied so that that the product may be equal to $(-6)^{-3}$?

22. The left column of the chart lists the lengths of input pieces of ribbon. Stretching machines are listed across the top. The other entries are the outputs for sending the input ribbon from that row through the machine from that column. Copy and complete the chart.

Input Length	Machine			
	x2			
	1	5		
3				15
	14		7	

23. **Shrinking Machine:** In a shrinking machine, a piece of stick is compressed to reduce its length. If 9cm long sandwich is put into the shrinking machine below, how many cm long will it be when it emerges?



24. Planet A is at a distance of 9.35×10^6km from Earth and planet B is 6.27×10^7km from Earth. Which planet is nearer to Earth?

25. Simplify:
$\left(\frac{1}{5}\right)^{45} \times \left(\frac{1}{5}\right)^{-60} - \left(\frac{1}{5}\right)^{+28} \times \left(\frac{1}{5}\right)^{-43}$

26. At the end of the 20th century, the world population was approximately 6.1×10^9 people. Express this population in usual form. How would you say this number in words?

27. Express the following in standard form:
Express 56km in m.

28. Simplify:
$\frac{(9)^3 \times 27 \times t^4}{(3)^{-2} \times (3)^4 \times t^2}$

29. Simplify:
$\left[\left(\frac{1}{3}\right)^{-3} - \left(\frac{1}{2}\right)^{-3}\right] \div \left(\frac{1}{4}\right)^{-3}$

30. Find x, if
$\left(\frac{1}{4}\right)^{-4} \times \left(\frac{1}{4}\right)^{-8} = \left(\frac{1}{4}\right)^{-4x}$

31. Find x, if
$\left(\frac{2}{5}\right)^{-3} \times \left(\frac{2}{5}\right)^{15} = \left(\frac{2}{5}\right)^{2+3x}$

32. Simplify:
$(2^2 + 3^2 - 4^2) \div \left(\frac{3}{2}\right)^2$

33. Write the following numbers in the usual form:
1.0001×10^9

34. Write the following numbers in the usual form:
3.61492×10^6

35. Simplify:
$\left[\left\{\left(\frac{-1}{4}\right)^2\right\}\right]^{-1}$

36. Evaluate:

$\left\{\left(\frac{1}{3}\right)^{-3}-\left(\frac{1}{2}\right)^{-3}\right\} \div\left(\frac{1}{4}\right)^{-3}$

37. Evaluate:

$\left[\left\{\left(\frac{-1}{3}\right)^{2}\right\}^{-2}\right]^{-1}$

38. Evaluate:

$\left(\frac{-3}{5}\right)^{-4} \times\left(\frac{-2}{5}\right)^{2}$

39. Evaluate:

$\left\{\left(\frac{-2}{3}\right)^{2}\right\}^{-2}$

40. Evaluate

(i) $\frac{8^{-1} \times 5^{3}}{2^{-4}}$

(ii) $\left(5^{-1} \times 2^{-1}\right) \times 6^{-1}$

41. Write the value of $(13)^{-13}+(13)^{13}$.

42. Solve the following

(i) $\left(\frac{1}{2}\right)^{-2}+\left(\frac{1}{2}\right)^{-3}$

(ii) $\left(\frac{2}{3}\right)^{-2} \times\left(\frac{2}{3}\right)^{5}$

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

44. Express $\frac{1.5 \times 10^{6}}{2.5 \times 10^{4}}$ in the standard form.

45. If $\frac{5^{m} \times 5^{3} \times 5^{-2}}{5^{5}}=5^{12}$. then find the value of m.

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