Test / Exam Name: Exponents And Powers **Standard: 8th** **Subject: Mathematics**

Instructions

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Q1. Find the multiplicative inverse of 7^{-2}. **1 Mark**

A 7^4 **B** 7^3 **C** 7^5 **D** 7^2

Ans: **D** 7^2

Q2. Find the multiplicative inverse of 5^{-3}. **1 Mark**

A 5^3 **B** $\frac{1}{5}$ **C** 5^2 **D** 5^{-2}

Ans: **A** 5^3

Solution:
The multiplicative inverse of 5^{-3} is 5^3.
$5^{-3} \times 5^3 = 1$

Q3. The multiplicative inverse of 10^5 is. **1 Mark**

A 5 **B** 10 **C** 10^{-5} **D** 10^5

Ans: **C** 10^{-5}

Solution:
$10^5 \times 10^{-5} = 2^{5-5} = 10^\circ = 1$

Q4. The value of $\log 105 + \log 32 - \log 80 - \log 21$ is: **1 Mark**

A $\log 4$ **B** $\log 3$ **C** $\log 5$ **D** $\log 2$

Ans: **D** $\log 2$

Q5. The value of $(3^4)^3$ is: **1 Mark**

A 3 **B** 3^{12} **C** 3^7 **D** None of the above.

Ans: **B** 3^{12}

Solution:
By law of exponent:
$(a^m)^n = a^{mn}$
$(3^4)^3 = 3^{4\times3}$
$= 3^{12}$

Q6. $\left(\frac{2}{3}\right)^{-5} \times \left(\frac{5}{7}\right)^{-5}$ is equal to: **1 Mark**

A $\left(\frac{2}{3} \times \frac{5}{7}\right)^{-10}$ **B** $\left(\frac{2}{3} \times \frac{5}{7}\right)^{-5}$
C $\left(\frac{2}{3} \times \frac{5}{7}\right)^{25}$ **D** $\left(\frac{2}{3} \times \frac{5}{7}\right)^{-25}$

Ans: **B** $\left(\frac{2}{3} \times \frac{5}{7}\right)^{-5}$

Solution:
We have:

$\left(\frac{2}{3}\right)^{-5} \times \left(\frac{5}{7}\right)^{-5} = \left(\frac{2}{3} \times \frac{5}{7}\right)^{-5}$

Q7. The expression, $(5^{-1} + 7^{-1} + 3^{-1})^0$ is equals to. **1 Mark**

A 15^{-3} **B** -3 **C** 15^{-1} **D** 1

Ans: **D** 1

Q8. $2 \times 2 \times 2 \times 2 \times 2$ is equal to. **1 Mark**

A 2^4 **B** 2^3 **C** 2^2 **D** 2^5

Ans: **D** 2^5

Q9. Tick (✓) the correct answer the following: **1 Mark**

The value of x for which $\left(\frac{7}{12}\right)^{-4} \times \left(\frac{7}{12}\right)^{3x} = \left(\frac{7}{12}\right)^{5}$, is:

A -1 **B** 1 **C** 2 **D** 3

Ans: **D** 3

Solution:

$\left(\frac{7}{12}\right)^{-4} \times \left(\frac{7}{12}\right)^{3x} = \left(\frac{7}{12}\right)^{5}$

$\Rightarrow \left(\frac{7}{12}\right)^{3x-4}$

$= \left(\frac{7}{12}\right)^{5}$

$= 3x - 4 = 5$

$= 3x = 5 + 4 = 9$

$\Rightarrow x = \frac{9}{3}$

$= 3$

Q10. **1 Mark**

Which of the following is the value of $\frac{\left(\frac{4}{5}\right)^{-9}}{\left(\frac{4}{5}\right)^{-9}}$?

A $\left(\frac{4}{5}\right)^{18}$ **B** $\frac{4}{5}$

C 1 **D** $\left(\frac{5}{4}\right)^{9}$

Ans: **C** 1

Solution:

$\frac{\left(\frac{4}{5}\right)^{-9}}{\left(\frac{4}{5}\right)^{-9}}$

$= \frac{\left(\frac{4}{5}\right)^{9}}{\left(\frac{4}{5}\right)^{9}} = 1$

Q11. Cube of $\frac{-1}{2}$ is: **1 Mark**

A $-\frac{1}{3}$ **B** $\frac{1}{16}$ **C** $-\frac{1}{8}$ **D** $\frac{-1}{16}$

Ans: **C** $-\frac{1}{8}$

Solution:

The cube of a number is the number raised to the power of 3. Hence the cube of $-\frac{1}{2}$ is $\frac{(-1)^3}{2^3}$

$= -\frac{1}{8}$

Q12. $(2^\circ + 4^{-1}) \times 2^2$ is equal to. **1 Mark**

A 2 **B** 3 **C** 4 **D** 5

Ans: **D** 5

Solution:
$(2^{\circ} + 4^{-1})$
$= \left(1 + \frac{1}{4}\right) \times 4$
$= \frac{5}{4} \times 4 = 5$

Q13. The multiplicative inverse of $\frac{1}{3^2}$ is: **1 Mark**

A 3^{-2} **B** 3^2 **C** 3 **D** $\frac{1}{3}$

Ans: **B** 3^2

Solution:
The multiplicative inverse of $\frac{1}{3^2}$ is 3^2.
$\frac{1}{3^2} \times 3^2 = 1$

Q14. The value of $\log_{abc}^{a^2} + \log_{abc}^{b^2} + \log_{abc}^{c^2}$ is equal to: **1 Mark**

A b **B** 2 **C** 1 **D** a

Ans: **B** 2

Q15. For any two non-zero rational nmbers a, $a^7 \div a^{12}$ is equal to: **1 Mark**

A a^5 **B** a^{-19} **C** a^{-5} **D** a^{19}

Ans: **C** a^{-5}

Solution:
$a^m \div a^n = a^{m-n}$
Hence,
$a^7 \div b^{12} = a^{7-12} = a^{-5}$

Q16. The standard form for 234000000 is: **1 Mark**

A 2.34×10^8 **B** 0.234×10^9 **C** 2.34×10^{-8} **D** 0.234×10^{-9}

Ans: **A** 2.34×10^8

Solution:
Given,
$234000000 = 234 \times 10^6$
$= 2.34 \times 10^6$
$= 2.34 \times 10^8$
Hence,
standard form of 234000000 is 2.34×10^8.

Q17. The number 86,800,000,000,000,000,000,000,000Kg is equals to. **1 Mark**

A 8.68×10^{25}K **B** 868×10^{23}Kg **C** 86.8×10^{-25}Kg **D** 868×10^{-23}m

Ans: **A** 8.68×10^{25}K

Q18. $(2^{-1} + 3^{-1} + 5^{-1})^0$ is equal to: **1 Mark**

A 2 **B** 3 **C** 5 **D** 1

Ans: **D** 1

Solution:
$(2^{-1} + 3^{-1} + 5^{-1})^0 = 1$ [$\because a^0 = 1$]

Q19. Simplify: $2^5 \div 2^{-6}$. **1 Mark**

A 2^9 **B** 2^{11} **C** 2^{10} **D** None of these

Ans: **B** 2^{11}

Q20. 1.5×10^{11} is equal to: **1 Mark**

A 150000000000 **B** 15000000000 **C** 1500000000 **D** 500000000000

Ans: **A** 150000000000

Solution:
$1.5 \times 10^{11} = 150,000,000,000$

Q21. The standard form for 0.000064 is: **1 Mark**

A 64×10^{4} **B** 64×10^{-4} **C** 6.4×10^{5} **D** 6.4×10^{-5}

Ans: **D** 6.4×10^{-5}

Solution:
Given,
$0.000064 = 0.64 \times 10^{-4}$
$= 6.4 \times 10^{-5}$
Hence,
standard form of 0.000064 is 6.4×10^{-5}.

Q22. $(-1)^{50}$ is equal to: **1 Mark**

A -1 **B** 1 **C** 50 **D** – 50

Ans: **B** 1

Solution:
$(-1)^{\text{even natural number}} = 1$

Q23. For which of the following is m= 8? **1 Mark**

A $\left(5^{m} - 5^{-3}\right)/5^{2} = 5^{3}$ **B** $-\left(5^{m} - 5^{-3}/5^{3} = 5^{2}\right.$
C $\left(5^{m} - 5^{3}\right)/5^{2} = 5^{3}$ **D** $\left(5 - 5^{-2}\right)/5^{2} = 5^{3}$

Ans: **A** $\left(5^{m} - 5^{-3}\right)/5^{2} = 5^{3}$

Solution:
$m = 8$
$= \left(5^{2} - 5^{-3}/5^{2} = 5^{3}\right.$
$= 5^{[8+(-3)]}/5^{2}$
$= 5^{5}/5^{2}$
$= 5^{3} = 5^{3}$
Hence Prove.

Q24. $\left(\frac{-1}{2}\right)^{5} \times \left(\frac{-1}{2}\right)^{3}$ is equal to: **1 Mark**

A $\left(\frac{-1}{2}\right)^{8}$ **B** $-\left(\frac{1}{2}\right)^{8}$
C $\left(\frac{1}{4}\right)^{8}$ **D** $\left(-\frac{1}{2}\right)^{15}$

Ans: **A** $\left(\frac{-1}{2}\right)^{8}$

Solution:
We have:
$\left(\frac{-1}{2}\right)^{5} \times \left(\frac{-1}{2}\right)^{3} = \left(\frac{-1}{2}\right)^{5+3}$
$= \left(\frac{-1}{2}\right)^{8}$

Q25. $3^{m} + 3^{-3} = 3^{5} \Rightarrow$ m is equal to: **1 Mark**

A 1 **B** 2 **C** 3 **D** 4

Ans: **B** 2

Solution:

$3^m + 3^{-3} = 3^5$

? $3^{m+3} = 3^5$

? m + 3 = 5

? m = 2

Q26. The value of $\log_2^{80} + \log_2^5 - \log_2^{20} - \log_2^{10}$ is equal to: **1 Mark**

A 3 **B** 1 **C** 2 **D** Not

Ans: **B** 1

Q27. Express 7.68 x 10^5 in usual form: **1 Mark**

A 768 **B** 768000 **C** 76800 **D** 7.6800000

Ans: **B** 768000

Solution:

$7.68 \times 10^5 = 768 \times 10^{-2} \times 10^5$

$= 768 \times 10^3$

= 768000

Q28. $(-2)^{-5} \times (-2)^6$ is equal to. **1 Mark**

A 2 **B** -2 **C** -5 **D** 6

Ans: **B** -2

Solution:

$(-2)^{-5} \times (-2)^6 = (-2)^{-5+6} = (-2)^1 = -2$

Q29. 865000 is equal to: **1 Mark**

A 8.65×10^5 **B** 8.65×10^3 **C** 8.65×10^6 **D** 8.65×10^4

Ans: **A** 8.65×10^5

Q30. $\log_x^y \times \log_y^z \times \log_y^x$ is equal to: **1 Mark**

A 3 **B** 0 **C** 1 **D** 2

Ans: **C** 1

Q31. Tick (✓) the correct answer the following: **1 Mark**

0.000367×10^4 in usual form is:

A 3.67 **B** 36.7 **C** 0.367 **D** 0.0367

Ans: **A** 3.67

Solution:

0.000367×10^4

$= 0.000367 \times 10000$

$= \frac{367}{1000000} \times 10000$

$= \frac{367}{100}$

$= 3.67$

Q32. When we have to add numbers in standard form, we convert them into numbers with the _____ exponents. **1 Mark**

A Same **B** Different **C** Not equal **D** None of these

Ans: **A** Same

Q33. $x^{\log_{x^2}^{x^4}}$ is equal to: **1 Mark**

A Not **B** x **C** x^2 **D** x^3

Ans: **C** x^2

Q34. Find the value of the expression a^2 for a = 10. **1 Mark**

A 100 **B** 1 **C** 10 **D** None of these

Ans: **A** 100

Q35. $(-2)^{m+1} \times (-2)^4 = (-2)^6 \Rightarrow m =$ **1 Mark**

A 0 **B** 1 **C** -1 **D** None of these.

Ans: **B** 1

Solution:
$(-2)^{m+1} \times (-2)^4 = (-2)^6$

Q36. $\left(\frac{1}{3}\right)^2$ is equal to: **1 Mark**

A 9 **B** -9 **C** $\frac{-1}{9}$ **D** $\frac{1}{9}$

Ans: **D** $\frac{1}{9}$

Solution:
$\left(\frac{1}{3}\right)^2 = \left(\frac{1}{3} \times \frac{1}{3}\right) = \frac{1}{9}$

Q37. Which one of the following is the value of 1^{15}. **1 Mark**

A 0 **B** 15 **C** 1 **D** None of these

Ans: **C** 1

Q38. The value of $\log m^n + \log m^{n+1} + \log m^{1+2n}$ is: **1 Mark**

A $2\log m$ **B** $n\log m$
C $\log m$ **D** $3\log m$

Ans: **A** $2\log m$

Q39. $\left(\frac{3}{4}\right)^5 \div \left(\frac{5}{3}\right)^5$ is equal to: **1 Mark**

A $\left(\frac{3}{4} \div \frac{5}{3}\right)^5$ **B** $\left(\frac{3}{4} \div \frac{5}{3}\right)^1$
C $\left(\frac{3}{4} \div \frac{5}{3}\right)^0$ **D** $\left(\frac{3}{4} \div \frac{5}{3}\right)^{10}$

Ans: **A** $\left(\frac{3}{4} \div \frac{5}{3}\right)^5$

Solution:
We have:
$\left(\frac{3}{4}\right)^5 \div \left(\frac{5}{3}\right)^5 = \left(\frac{3}{4} \div \frac{5}{3}\right)^5$

Q40. Size of a microorganism is 0.00000079m. Express it into standard form: **1 Mark**

A 7.9×10^{-3} **B** 7.9×10^{-7} **C** 7.9×10^{-9} **D** 7.9×10^{-5}

Ans: **B** 7.9×10^{-7}

Solution:
$0.00000079 = 7.9 \times 10^{-8}$
$= 7.9 \times 10 \times 10^{-8}$
$= 7.9 \times 10^{-7}$

Q41. Tick (✓) the correct answer the following: **1 Mark**

$\left(\frac{-3}{4}\right)^2 = ?$

A $\frac{-9}{16}$ **B** $\frac{9}{16}$ **C** $\frac{16}{9}$ **D** $\frac{-16}{9}$

Ans: **B** $\frac{9}{16}$

Solution:

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

$= \left(\frac{-3}{4}\right) \times \left(\frac{-3}{4}\right)$

$= \frac{9}{16}$

Q42. $2^2 \times 2^3 \times 2^4$ is equal to: **1 Mark**

A 2^{24} **B** 2^{-5} **C** 2^9 **D** 2^{-9}

Ans: **C** 2^9

Solution:

By laws of exponents:

$a^m \times a^n = a^{m+n}$

$2^2 \times 2^3 \times 2^4 = 2^{2+3+4} = 2^9$

Q43. The multiplicative inverse of $\left(-\frac{5}{9}\right)^{-99}$ is: **1 Mark**

A $\left(-\frac{5}{9}\right)^{99}$ **B** $\left(\frac{5}{9}\right)^{99}$

C $\left(\frac{9}{-5}\right)^{99}$ **D** $\left(\frac{9}{5}\right)^{99}$

Ans: **A** $\left(-\frac{5}{9}\right)^{99}$

Solution:

For multiplicative inverse, a is called multiplicative inverse of b, if a × b = 1.

Put b = $\left(-\frac{5}{9}\right)^{-99}$

$\Rightarrow a \times \left(\frac{-5}{9}\right)^{-99} = 1$

$\Rightarrow a = \frac{1}{\frac{-5}{9}}^{-99}$

$\Rightarrow a = \left(-\frac{5}{9}\right)^{99} \left[\because a^{-m} = \frac{1}{a^m}\right]$

Q44. The multiplicative inverse of 10^{-100} is: **1 Mark**

A 10 **B** 100 **C** 10^{100} **D** 10^{-100}

Ans: **C** 10^{100}

Solution:

For multiplicative inverse, let a be the multiplicative inverse of 10^{-100}.

so, a × b = 1

$\therefore a \times 10^{100} = 1$

$\Rightarrow a = \frac{1}{10^{-100}} \times \frac{1}{\frac{1}{10^{100}}} \left[\because a^{-m} = \frac{1}{a^m}\right]$

$= 10^{100}$

Q45. Write the expression using exponents: 61 × 61 × 61 × 61 × 61. **1 Mark**

A 6^{12} **B** 6^{13} **C** 6^{14} **D** 6^{15}

Ans: **D** 6^{15}

Q46. In standard form 21600000 is written as. **1 Mark**

A 2.16×10^7 **B** 216×10^7 **C** 2.16×10^5 **D** 216×100000

Ans: **A** 2.16×10^7

Q47. If x be any integer different from zero and m be any positive integer, then x^{-m} is equal to: **1 Mark**

A x^m **B** $-x^m$
C $\frac{1}{x^m}$ **D** $\frac{-1}{x^m}$

Ans: **C** $\frac{1}{x^m}$

Solution:
Using law of exponents, $a^{-m} = \frac{1}{a^m}$ [$\because$ a is non-zero integer]
Similarly,
$x^{-m} = \frac{1}{x^m}$

Q48. The multiplicative inverse of 7^{-2} is: **1 Mark**

A 7^2 **B** 7 **C** $\frac{1}{7^2}$ **D** $\frac{1}{7}$

Ans: **A** 7^2

Solution:
The multiplicative inverse of any value is the one which when multiplied by the original value gives a value equal to 1.
$7^{-2} = \frac{1}{7^2}$
Hence, $7^2 \times \frac{1}{7^2} = 1$

Q49. The reciprocal of $\left(\frac{2}{5}\right)^{-1}$ is **1 Mark**

A $\frac{2}{5}$ **B** $\frac{5}{2}$ **C** $-\frac{5}{2}$ **D** $-\frac{2}{5}$

Ans: **B** $\frac{5}{2}$

Using law of exponents, $a^{-m} = \frac{1}{a^m}$ [$\because$ a is non-integer]
$\therefore \left(\frac{2}{5}\right)^{-1} = \frac{1}{\left(\frac{2}{5}\right)^1}$
$= \frac{5}{2}$

Q50. If $(-3)^{m+1} \times (-3)^5 = (-3)^7$, then the value of m is: **1 Mark**

A 5 **B** 7 **C** 1 **D** 3

Ans: **C** 1

Solution:
$(-3)^{m+1} \times (-3)^5 = (-3)^7$
$(-3)^{m+1+5} = (-3)^7$

Q51. If $\log_{m^y}^{m^x} = \frac{3}{4}$ then the value of $8x - 6y + 1$ is equal to: **1 Mark**

A 3 **B** 0 **C** 2 **D** 1

Ans: **D** 1

Q52. $100^0 + 20^0 + 5^0$ is equal to: **1 Mark**

A 125 **B** 25 **C** $\frac{1}{125}$ **D** 3

Ans: **D** 3

Solution:
By exponent law we know:
$a^0 = 1$
$100^0 + 20^0 + 5^0 = 1 + 1 + 1 = 3$

Q53. $3^2 \times 3^{-4} \times 3^5$ is equal to. **1 Mark**

A 3 **B** 3^2 **C** 3^3 **D** 3^5

Ans: **C** 3^3

Solution:
$3^2 \times 3^{-4} \times 3^5 = 3^{2-4+5} = 3^3$

Q54. The usual form for 2.03×10^{-5} **1 Mark**

A 0.203 **B** 0.00203 **C** 203000 **D** 0.0000203

Ans: **D** 0.0000203

Solution:
Given,
$2.03 \times 10^{-5} = 0.0000203$
[$\because$ placing decimal five digit towards left of original position]

Q55. Write 0.00000000256 in standard form: **1 Mark**

A 2.56×10^{-11} **B** $2.56 \times lO^{-10}$ **C** 2.56×10^{-8} **D** 2.56×10^{-9}

Ans: **D** 2.56×10^{-9}

Solution:
$0.00000000256 = \frac{256}{100000000000}$
$= \frac{2.56 \times 100}{100000000000}$
$= \frac{2.56}{100000000000}$
$= 2.56 \times 10^{-9}$

Q56. $\frac{a^m}{b^m}$ is equal to bm. **1 Mark**

A $\left(\frac{a}{b}\right)^m$ **B** $\left(\frac{b}{a}\right)^m$
C $\left(\frac{a^m}{b}\right)^m$ **D** $\left(\frac{a}{b^m}\right)^m$

Ans: **A** $\left(\frac{a}{b}\right)^m$

Q57. Mark (✓) against the correct answer of the following: **1 Mark**
The value of $\left(\frac{3}{4}\right)^{-3}$ is:

A $\frac{-27}{64}$ **B** $\frac{64}{27}$ **C** $\frac{-9}{4}$ **D** $\frac{27}{64}$

Ans: **B** $\frac{64}{27}$

Solution:
$= \left(\frac{3}{4}\right)^{-3}$
$= \left(\frac{4}{3}\right)^3$
$= \frac{4^3}{3^3}$
$= \frac{64}{27}$

Q58. Which of the following is the multiplicative inverse of $(3 \times 4)^{-2}$ **1 Mark**

A $\frac{1}{144}$ **B** 144 **C** $\frac{1}{12}$ **D** 12

Ans: **D** 12

Q59. If 1 nanometer is equal to $\frac{1}{1000000000}$ m Write 23 nanometer in meter and in standard form: **1 Mark**

A 2.3×10^{-8}m **B** 2.3×10^{-9}m
C 2.3×10^{-10}m **D** $\frac{23}{1000000000}$ m

Ans: **A** 2.3×10^{-8}m

Solution:

$1\text{nm} = \frac{1}{1000000000}\text{m} = 1 \times 10^{-9}$

Multiplying 23 to both side,

23nm = $23 \times 1 \times 10^{-9}$

= 23×10^{-9}

= $23 \times 10 \times 10^{-9}$

= 2.3×10^{-8}m

Q60. 16 is the multiplicative inverse of. **1 Mark**

A 2^{-4} **B** 2^{8} **C** 8^{2} **D** 2^{4}

Ans: **A** 2^{-4}