Test / Exam Name: 1
Student Name: .....
Standard: 7TH
Section: .....
Subject: MATHEMATICS
Roll No.: .....

Questions: 578	Time: 60 Mins	Marks: 780

Instructions

1. CBSE 7TH MATHS - EXPONENTS AND POWERS.
2. THIS WORKSHEET PDF FORMAT ANSWERS COST RS.30 ONLY. WHATSAPP 8056206308 FOR DETAILS .

Q1. The exponential form is an easier way of writing repeated multiplication involving base and exponentsBelow here are given some cases. and express the expresion in the single exponent form. **5 Marks**

i. Express $5^2 \times 7^2$ in single exponential form.
   a. 7^3
   b. 7^4
   c. 35^2
   d. None of these

ii. Express (-5)5 × (-5) in single exponential form.
   a. $(-5)^6$
   b. $(-5)^5$
   c. $(-5)^3$
   d. $(-5)^7$

iii. Express $(-3)^3 \times (-10)^3$ in single exponential form.
   a. 30^1
   b. 30^2
   c. 30^3
   d. 30^4

iv. Express the following numbers in standard form: 76,47,000
   a. 7.647×10^6
   b. 76.47×10^5
   c. 7.647×10^7
   d. None of these

v. Express the following numbers in standard form: 8,19,00,000
   a. 8.19×10^8
   b. 8.19×10^7
   c. 81.9×10^7
   d. 8.19×10^5

Q2. 10^3 stands foe the 10 × 10 × 10 and the value calculated as the 1000 and likewise all the exponent are expressed. also the general number can be expressed as the exponents like 400 can be expressed as 20^2. Below here are given some cases. And express in the power of the natural number. **5 Marks**

i. Express 729 as a power of 3.
   a. 3^7
   b. 3^5
   c. 3^8
   d. 3^6

ii. Express 128 as a power of 2.
   a. 2^7
   b. 2^6
   c. 2^5
   d. 2^8

iii. Express 343 as a power of 7.
   a. 7^4
   b. 7^3
   c. 7^5
   d. 7^2

iv. Find the value of 2^6.
   a. 18
   b. 128
   c. 36
   d. 64

v. Find the value of 9^3.
   a. 629
   b. 829
   c. 729
   d. None of these

Q3. 10^3 stands foe the 10 × 10 × 10 and the value calculated as the 1000 and likewise all the exponent are expressed. Below here are given some cases. And identify the greater number. **5 Marks**

i. Identify the greater number, wherever possible, in each of the following? 4^3 or 3^4
   a. 3^4
   b. 4^3

ii. Identify the greater number, wherever possible, in each of the following? 5^3 or 3^5
   a. 5^3
   b. 3^5

iii. Identify the greater number, wherever possible, in each of the following? 2^8 or 8^2
   a. 2^8
   b. 8^2

iv. Identify the greater number, wherever possible, in each of the following? 100^2 or 2^{100}
   a. 100^2
   b. 2^{100}

v. Identify the greater number, wherever possible, in each of the following? 2^{10} or 10^2
   a. 2^{10}
   b. 10^2

Q4. In the case of mathmatical application all the exponents are written in the general form and the mathematical application are done. Below here are given some cases. and simplify the expression. **5 Marks**

i. Simplify: $7^2 \times 2^2$
   a. 200
   b. 196
   c. 386

ii. Simplify: $2^3 \times 5$
   a. 40
   b. 50
   c. 100

iii. Simplify: 3×4^4
   a. 768
   b. 800
   c. 765

iv. Simplify: 0×10^2
   a. 1
   b. 0
   c. 2

v. Simplify: $5^2 \times 3^3$
   a. 700
   b. 670
   c. 675

Q5. The short notation 10^4 stands for the product 10 × 10 × 10 × 10. Here '10' is called the base and '4' the exponent. The number 10^4 is read as 10 raised to the power of 4 or simply as fourth power of 10. 10^4 is called the exponential form of 10,000 similarly all the numbers can br represented .Below here are given some cases. And express the following in exponent form. **5 Marks**

i. Express the following in exponential form: 6 × 6 × 6 × 6
   a. 6^4
   b. 4^6

ii. Express the following in exponential form: t × t
   a. 2^t
   b. t^2

iii. Express the following in exponential form: b × b × b × b
   a. b^4
   b. 4^b

iv. Express the following in exponential form: 5 × 5 × 7 × 7 × 7
   a. $2^2 \times 3^7$
   b. $5^2 \times 7^3$

v. Express the following in exponential form: 2 × 2 × a × a
   a. $2^2 \times a^2$
   b. $a^2 \times 6^2$

Q6. If $\frac{p}{q} = \left(\frac{3}{2}\right)^2 \div \left(\frac{9}{4}\right)^0$ find the value of $\left(\frac{p}{q}\right)^3$ **4 Marks**

Q7. In our own planet Earth, 361,419,000 square kilometre of area is covered with water and 148,647,000 square kilometre of area is covered by land. Find the approximate ratio of area covered with water to area covered by land by converting these numbers into scientific notation. **4 Marks**

Q8. Find the values of n in the following: **4 Marks**

If $\frac{9^n \times 3^2 \times 3^n - 27^n}{(3^3)^5 \times 2^3} = \frac{1}{27}$, find the value of n

Q9. Find the reciprocal of the rational number $\left(\frac{1}{2}\right)^2 \div \left(\frac{2}{3}\right)^3$ **4 Marks**

Q10. Express the given information in Scientific notation (standard form) and then arrange them in ascending order of their size. **4 Marks**

	Deserts of the world	Area (in sq km)
1	Kalahari, South Africa	932,400
2	Thar, India	199,430
3	Gibson, Australia	155,400
4	Great Victoria, Australia	647,500
5	Sahara, North Africa	8,598,800

Q11. Find the value of n, where n is an integer and $2^{n-5} \times 6^{2n-4} = \frac{1}{12^4 \times 2}$ **4 Marks**

Q12. Arrange in ascending order: **3 Marks**

2^{2+3}, $(2^2)^3$, 2×2^2, $\frac{3^5}{3^2}$ $3^2 \times 3^0$, $2^3 \times 5^2$

Q13. **3 Marks**

Evaluate:

$\frac{125 \times 5^2 \times a^7}{10^3 \times a^4}$

Q14. Simplify: **3 Marks**

$(3^5)^{11} \times (3^{15})^4 - (3^5)^{18} \times (3^5)^5$

Q15. Simplify the following and express a rational number: **3 Marks**

$\left(\frac{-1}{2}\right)^5 \times 2^3 \times \left(\frac{3}{4}\right)^2$

Q16. Simplify and write the following in exponential form: **3 Marks**

$\frac{9^8 \times (x^2)^5}{(27)^4 \times (x^3)^2}$

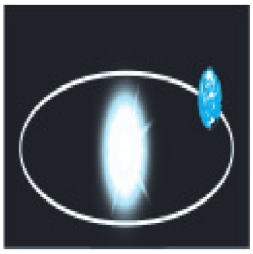
Q17. Express the following in power notation: **3 Marks**

$\frac{-32}{243}$

Q18. A light year is the distance that light can travel in one year. 1 light year = 9,460,000,000,000km. **3 Marks**

a. Express one light year in scientific notation.

b. The average distance between Earth and Sun is 1.496 × 108km. Is the distance between Earth and the Sun greater than, less than or equal to one light year?



Q19. Find x such that $\left(\frac{3}{5}\right)^3 \times \left(\frac{3}{5}\right)^{-6} = \left(\frac{3}{5}\right)^{2x-1}$ **3 Marks**

Q20. **3 Marks**

Evaluate:

$\frac{5^4 \times 7^4 \times 2^7}{8 \times 49 \times 5^3}$

Q21. Simplify and express each of the following in exponential form: **3 Marks**

\(\dfrac{2^8\times

Q22. Write the number of seconds in scientific notation. **3 Marks**

	Unit	Value in Seconds
1	1 Minute	60
2	1 Hour	3,600
3	1 Day	86,400
4	1 Month	2,600,000
5	1 Year	32,000,000

6	10 Years	3,20,000,000

Q23. Simplify: **3 Marks**

$$\frac{16 \times 2^{n+1} - 8 \times 2^n}{16 \times 2^{n+2} - 4 \times 2^{n+1}}$$

Q24. By what number should $(-4)^5$ be divided so that the quotient may be equal to $(-4)^3$? **3 Marks**

Q25. Find the values of n in the following: **3 Marks**

$$\left(\frac{3}{2}\right)^4 \times \left(\frac{3}{2}\right)^5 = \left(\frac{3}{2}\right)^{2n+1}$$

Q26. If $2^{n-7} \times 5^{n-4} = 1250$, fimd the value of n. **3 Marks**

Q27. Simplify the following and express a rational number: **3 Marks**

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

Q28. Simplify: **3 Marks**

$$\frac{(16)^7 \times (25)^5 \times (81)^3}{(15)^7 \times (24)^5 \times (80)^3}$$

Q29. Express the given information in Scientific notation and then arrange them in descending order of their size. **3 Marks**

	Name of the Planet	Mass (in kg)
1	Mercury	330000000000000000000000
2	Venus	487000000000000000000000
3	Earth	598000000000000000000000
4	Mars	642000000000000000000000
5	Jupiter	1900000000000000000000000000
6	Saturn	569000000000000000000000000
7	Uranus	869000000000000000000000000
8	Neptune	1020000000000000000000000000
9	Pluto	131000000000000000000000

Q30. Express the following in power notation: **3 Marks**

$$\frac{-1}{128}$$

Q31. Simplify and write the following in exponential form: **3 Marks**

$$\frac{3^2 \times 7^8 \times 13^6}{(21)^2 \times (91)^3}$$

Q32. Find m so that $\left(\frac{2}{9}\right)^3 \times \left(\frac{2}{9}\right)^6 = \left(\frac{2}{9}\right)^{2m-1}$ **3 Marks**

Q33. **3 Marks**

Evaluate:

$$\frac{6^4 \times 12^3 \times 36}{2^5 \times 36}$$

Q34. **3 Marks**

Evaluate:

$$\frac{3^4 \times 12^3 \times 36}{2^5 \times 6^3}$$

Q35. **3 Marks**

Simplify:

$$\frac{3^5 \times 10^5 \times 25}{5^7 \times 6^3}$$

Q36. Arrange in ascending order: **3 Marks**

2^5, 3^3, $2^3 \times 2$, $(3^3)^2$, 3^5, 4^0, $2^3 \times 3^1$

Q37. If $2^{n+2} - 2^{n+1} + 2^n = c \times 2^n$, find the value of c. **3 Marks**

Q38. If $2^{n-7} \times 5^{n-4} = 1250$, find the value of n. **3 Marks**

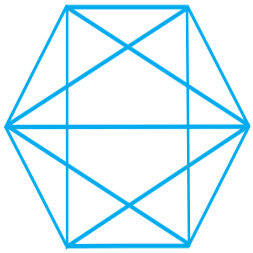
Q39. **3 Marks**

Evaluate:

$$\left(\frac{6 \times 10}{2^2 \times 5^3}\right)^2 \times \frac{25}{27}$$

Q40. Geometry Application: **3 Marks**

The number of diagonals of an n-sided figure is $\frac{1}{2}(n^2 - 3n)$ Use the formula to find the number of diagonals for a 6-sided figure (hexagon).



Q41. How many times of 30 must be added together to get a sum equal to 30^7? **3 Marks**

Q42. Simplify: **3 Marks**

$$\frac{10 \times (5)^{n+1} + 25 \times 5^n}{3 \times (5)^{n+2} + 10 \times (5)^{n+1}}$$

Q43. Simplify: **3 Marks**

$$\frac{16 \times (2)^{n+1} - 4 \times 2^n}{16 \times (2)^{n+2} - 2 \times (2)^{n+2}}$$

Q44. Simplify the following and express a rational number: **3 Marks**

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

Q45. **3 Marks**

Evaluate:

$$\frac{15^4 \times 18^3}{3^3 \times 5^2 \times 12^2}$$

Q46. **3 Marks**

Evaluate:

$$\frac{7^8 a^{10} b^7 c^{12}}{7^6 a^8 b^4 c^{12}}$$

Q47. Express the following numbers using exponential notations: **2 Marks**

1024

Q48. Write the following numbers in the expanded forms: **2 Marks**

120719

Q49. Express the following as a rational number: **2 Marks**

$$\left(\frac{5}{7}\right)^{-1} \times \left(\frac{7}{4}\right)^{-1}$$

Q50. Life Science Application: 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? **2 Marks**

Q51. Find the vallue of n when: **2 Marks**

$8 \times 2^{n+2} = 32$

Q52. Blubber: makes up 27 per cent of a blue whale's body weight. Deepak found the average weight of blue whales and used it to calculate the average weight of their blubber. He wrote the amount as $2^2 \times 3^2 \times 5 \times 17$kg. Evaluate this amount. **2 Marks**

Q53. The speed of light in vaccum is 3 × 108m/s. Sunlight takes about 8 minutes to reach the earth. Express distance of Sun from Earth in standard form. **2 Marks**

Q54. Simplify and express each of the following in exponential form: **2 Marks**

\(\Big(\dfrac{\tex

Q55. Find the number from the following expanded forms: **2 Marks**

$5 \times 10^5 + 4 \times 10^4 + 2 \times 10^3 + 3 \times 10^0$

Q56. **2 Marks**

Simplify:

$$\left(\frac{-3}{2}\right)^3 \div \left(\frac{-3}{2}\right)^6$$

Q57. Write the following numbers in the expanded forms: **2 Marks**