# INDIAN SCHOOL AL WADI AL KABIR

**Class VII**, Mathematics

***Worksheet*- EXPONENTS AND POWERS**

***07*-02-2021**

**OBJECTIVE TYPE (1 Mark)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Q.1. | The exponential form of 243 is | | | | | | | |
| | **A** | $3^2$ | **B** | $3^3$ | **C** | $3^4$ | **D** | $3^5$ |
| Q.2. | The value of $(-2)^3$ is | | | | | | | |
| | **A** | 8 | **B** | $-8$ | **C** | 16 | **D** | $-16$ |
| Q.3. | $(-1)^{\text{odd number}}$ = | | | | | | | |
| | **A** | $-1$ | **B** | 1 | C | 0 | **D** | None of these |
| Q.4. | For a non-zero rational number x, $x^5 \div x^2$ is equal to | | | | | | | |
| | **A** | $x^7$ | **B** | $x^3$ | **C** | $x^5$ | **D** | $x^2$ |
| Q.5. | The value of $4^4$ is | | | | | | | |
| | **A** | 256 | **B** | 228 | **C** | 281 | **D** | 400 |
| Q.6. | $(-1)^{17} + (-1)^{16}$ equals | | | | | | | |
| | **A** | $-1$ | **B** | 1 | **C** | 0 | **D** | $-2$ |
| Q.7. | In standard form, the number 829030000is written as k $\times$ $10^8$ where k is equal to | | | | | | | |
| | **A** | 82903 | **B** | 829.03 | **C** | 82.903 | **D** | 8.2903 |
| Q.8 | $[(-7)^3]^2$ is equal to | | | | | | | |
| | **A** | $(-7)^6$ | **B** | $(-7)^5$ | **C** | $(-7)^{32}$ | **D** | $(-7)^{12}$ |
| Q.9 | Exponential form of $5 \times x \times x \times x \times x \times x \times x \times x$ is | | | | | | | |
| | **A** | $5 \times 7x$ | **B** | $5x^2x^5$ | **C** | $5x^7$ | **D** | $5x^5$ |
| Q.10 | If $3^n = 27$, then the value of n is | | | | | | | |
| | **A** | 2 | **B** | 3 | **C** | 4 | **D** | 5 |

Q.11

CASE STUDY:

The solar system consists of star, the Sun, and everything bound to it by gravity — the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune, dwarf planets such as Pluto, dozens of moons and millions of asteroids, comets and meteoroids.

| PLANET | DISTANCE FROM SUN(KM) | NUMBER OF MOONS | DISTANCE FROM EARTH (KM) |
|---|---|---|---|
| MERCURY | 58,000,000 | 0 | 92,000,000 |
| VENUS | 108,000,000 | 0 | 42,000,000 |
| EARTH | 150,000,000 | 1 | ---------- |
| MARS | 228,000,000 | 2 | 78,000,000 |
| JUPITER | 778,000,000 | 63 | 628,000,000 |
| SATURN | 1,427,000,000 | 61 | 1,277,000,000 |
| URANUS | 2,870,000,000 | 27 | 2,720,000,000 |
| NEPTUNE | 4,497,000,000 | 13 | 4,347,000,000 |

A light year is the distance that light can travel in one year.

1 light year = 9,460,000,000,000 km.

i) Express one light year in scientific notation.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | $9.46 \times 10^{12}$ | B | $946 \times 10^{12}$ | C | $94.6 \times 10^{13}$ | D | $9.46 \times 10^{10}$ |

ii) The average distance between Earth and Sun is $1.496 \times 10^{8}$ km. The distance between Earth and the Sun is _____ one light year.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | Greater than | B | Less than | C | equal | D | None of these |

iii) The distance between Sun and Saturn in standard form is

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | $1.277 \times 10^{9}$ | B | $1277\times 10^{9}$ | C | $1.427 \times 10^{9}$ | D | $1427\times 10^{9}$ |

iv) The number of moon(s) earth has is

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | $10^{0}$ | B | $10^{1}$ | C | $10^{2}$ | D | $10^{3}$ |

v) The number of moon(s) Uranus has is_____(in exponential form)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | 1 | B | $2^{3}$ | C | $13^{3}$ | D | $3^{3}$ |

| | |
|---|---|
| **Fill in the blanks(1mark)** | |
| Q12. | 1296 can be written in exponential form as_____ |
| Q13. | If a is any non-zero integer, then $a^0 =$ _____ |
| Q14. | The greater among $3^5 and\ 5^3\ is$ _____ |
| Q15. | The number for $6\times 10^4 + 7 \times 10^3 + 1 \times 10^2 + 0 \times 10^1 + 3 \times 10^0$ is _____ |
| Q16. | The value of $(3^0 + 2^0) \times 4^0$ is _____ |
| **SECTION B (2 marks)** | |
| Q17. | Express 121 × 243 as a product of prime factors only in exponential form. |
| Q18. | Simplify $[(-2)^3 \times (-2)^4] \div (-2)^7$ |
| Q19. | Express 128 as a power of 2. |
| Q20. | Find the value of $(3^0 - 2^0) \times (3^0 + 2^0)$ |
| Q21. | Simplify and express $(3^7 \div 3^5)^4$ in exponential form. |
| **SECTION C (4marks)** | |
| Q22. | In the questions given below, state whether the given statements are True or False.<br>a) $10\times 10^{11} = 100^{11}$<br>b) $4^2$ is greater than $2^4$.<br>c) $5^0 \times 25^0 \times 125^0 = (5^0)^6$<br>d) $4^0 + 5^0 + 6^0 = (4 + 5 + 6)^0$ |
| Q23. | Simplify and express in exponential form:<br>a) $(3^{12} \div 3^8) \times 3^5$<br>b) $\{(6^3)^2 \times 6^4\} \div 6^8$ |
| Q24. | Simplify $\frac{2^5\times3^4\times16}{3^2\times64}$ |
| Q25. | Simplify $\frac{(2^5)^2\times7^3}{8^3\times7}$ |
| Q26. | Evaluate $\frac{7^8\times a^{10}b^7c^{12}}{7^6\times a^8b^4c^{12}}$ |
| | |

| Answers | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Answers** | **1** | d | **2** | b | **3.** | a | **4** | b |
| | **5** | a | **6** | c | **7** | d | **8** | a |
| | **9** | c | **10** | b | **11** | i) A<br>ii) B<br>iii) C<br>iv) A<br>v) D | **12** | $2^4 \times 3^4$ |
| | **13** | 1 | **14** | $3^5$ | **15** | 67103 | **16** | 2 |
| | **17** | $11^2 \times 3^5$ | **18** | 1 | **19** | $2^7$ | **20** | 0 |
| | **21** | $3^8$ | **22** | a) FALSE<br>b) FALSE<br>c) TRUE<br>d) FALSE | **23** | a) $3^9$<br>b) $6^2$ | **24** | 72 |
| | **25** | 98 | **26** | $49a^2b^3$ | | | | |

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