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Class: VII
Subject: Math's
Topic: Exponents and power
No. of Questions: 25

Q1. Express in exponential notation

A. 125
B. +64
C. 81
D. -343

Sol: A. $125 = 5 \times 5 \times 5 = 5^3$ B. $64 = 2x2x2x2$ and $(-2)x(-2) \times (-2) \times (-2)$ ; $(-2)^6$ or $2^6$ C. $81 = 3x3x3x3 = 3^4$ D. $-343 = (-7)x(-7)x(-7)$ ; So , $(-7)^3$

Q2. Express 729 a powers of 3

Sol: $3^6$ (By definition )

Q3. Express -128 a powers of (-2)

Sol: $(-2)^7$ (By definition )

Q4. Write a x a x a x a x b x b x b in exponential form.

Sol: $a^4 \times b^3$ (By definition)

Q5. Evaluate

A. $2^6$
B. $3^5$
C. $(-3)^4$

Sol: A. 64 B.243 C. +81 (By definition )

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Q6. Evaluate

(i) $(-2)^3 \times (-3)^2$
(ii) $5^2 \times 2^5$

Sol: (i) -72 (ii) 800 (By definition )

Q7. Write the base and the exponent in each of the following

(i) $7^7$
(ii) $3^{-5}$
(iii) $2^4$

| | Base | Expo |
|---|---|---|
| Sol: 1. | 7 | 7 |
| 2. | 3 | -5 |
| 3. | 2 | 4 |

Q8. Express in exponential form

(i) (-2) x (-2) x (-2) x (-2)
(ii) 8 x 8 x 3 x 3 x (-5) x (-5)

Sol: 1. $(-2)^4$

2. $8^2 \times 3^2 \times (-5)^2$ (By definition)

Q9. Evaluate

(i) $(-1)^{19} \times (-1)^{26}$
(ii) $(-1)^{21} - (-1)^{22}$
(iii) $(-1)^{77} - (-1)^5$

Sol: 1. -1

2. -2

3. 0

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Q10. Find the difference between

(i) $5^2$ and $2^5$
(ii) $3^4$ and $4^3$

Sol: (i). $25 - 32 = -7$

(ii). $81 - 64 = 17$

Q11. Which in greater

(i) $5^3$ or $3^5$
(ii) $2^6$ or $6^2$

Sol: (i) $125 < 243$; $3^5 > 5^3$

(ii) $64 > 36$; $26 > 6^2$

Q12. Evaluate

(i) $\left(\frac{3}{5}\right)^4$
(ii) $\left(\frac{-4}{5}\right)^5$

Sol: (i) $\frac{81}{625}$ (ii) $\frac{-1024}{3125}$ ( By definition )

Q13. Express in power notation and write down the base and power.

(i) $\frac{49}{81}$
(ii) $\frac{-8}{27}$

Sol: (i) $\left(\frac{7}{9}\right)^2$ Base $=\frac{7}{9}$, Power = 2 (ii) $\left(\frac{-2}{3}\right)^3$ $base = \frac{-2}{3}$ power = 3

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Q14. Simplify $\left(\frac{2}{3}\right)^4 \times \left(\frac{10}{15}\right)^2 \times \left(\frac{-9}{16}\right)$

Sol: $\left(\frac{-4}{81}\right)$ (By calculation)

Q15. Simplify using laws of exponents

(i) $a^2 \times a^3 \times a^{-5}$

(ii) $\frac{a^4 \times a^{-2} \times b^4}{a^8 \times a^{-6} \times b^2}$

sol: (i) 1 ; law of addition of exponents (ii) $b^2$ ; law of addition of exponents

Q16. Simplify using laws of exponents

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

(ii) $(10^5 \times 3^2 \times 7^2)^0$

Sol: (i) $\frac{108}{25}$ (ii) 1 law of addition of exponents

Q17. Simplify by factorizing the number into prime factors and using lows of exponents

(i) 108 x 192

(ii) 270 x 1125

Sol: (i) 20736 (ii) 303750 (law of addition of exponents )

Q18. Find the value of

(i) $(243)^{2/5}$

(ii) $(512)^{\frac{-2}{9}}$

Sol: (i) 9 (ii) $\frac{1}{4}$ law of addition of exponents

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Q19. Simplify: $(18)^{\frac{1}{3}} \times (768)^{\frac{1}{3}}$

Sol: 24 (law of addition of exponents )

Q20. Simplify: $\frac{5^{-2}\times 3^{-3}\times (125)^{\frac{2}{3}}}{(27)^{\frac{-2}{3}}\times (32)^{\frac{-1}{5}}}$

Sol: $\frac{2}{3}$ ; law of addition of exponents

Q21. Using laws of exponents, simplify: $\frac{2^3\times 3^4\times 4}{3\times 32}$

Sol: 27; law of addition of exponents

Q22. Simplify: $\frac{\left(5^2\right)^3\times 5^4}{5^7}$

Sol: 125; law of addition of exponents

Q23. Simplify: $\frac{4^5\times\ a^8\times\ b^3}{4^6\times\ a^7\times\ b^2}$

Sol: $\frac{ab}{4}$ ; by law of addition of exponents

Q24. Simplify: $\left[\left(\frac{-2}{3}\right)^4 \times \frac{216}{125}\right] \div \left(\frac{6}{5}\right)^2 \times \left(\frac{4}{9}\right)$

Sol: $\frac{8}{15}$ ; by law of addition of exponents

Q25. Simplify: $\frac{3^2+3^3+3^4}{3^1+3^2+3^3}$

Sol: 3; law of addition of exponents