

SATISH CHANDRA MEMORIAL SCHOOL

Class: VII

Chapter 11: Exponents and Powers

A. Choose the correct answer:

1. Which of the following must be multiplied with 2^{3x} to make it 2^{5x+1} ?

- (a) 2^{2x} (b) $(2x + 1)$ (c) 2^{2x+1} (d) 2^{3x+1}

2. Which of the following is the multiplicative inverse of 5^4 ?

- (a) 5^0 (b) 5^{-4} (c) $(-5)^4$ (d) $(-5)^{-4}$

3. If $8^{3x+2y} = p^3 q^2$ and $8^y = q$, then the value of 64^x is –

- (a) p^5 (b) q^2 (c) p^2 (d) pq

4. $(5^6)^4 \div 5^{20} = ?$

- (a) 25 (b) 125 (c) 625 (d) 225

5. The number 3^{-5} lies on numberline between –

- (a) 3 and 4 (b) (-3) and (-4) (c) (-1) and 0 (d) 0 and 1

B. True or False:

1. For any integer x , negative power of x is the reciprocal of its same positive power.

2. Since 2 less than 3, 2^{10} will be less than 3^6 .

3. The value of $(-2) \times (-1.73) \times 13 \times (-3)^n$ is positive when n is an odd positive integer.

C. Express the following numbers into the product of the powers of its prime factors:

4620, 880, 1752

D. Which one is greater? 5^{12} or 12^5 ; 17^6 or 6^{17} ; 2.25×10^{13} or 3.45×10^{11}

E. Arrange the following numbers in descending order: 2^{-4} , $\left(\frac{2}{3}\right)^2$, $\left(\frac{3}{4}\right)^{-2}$, 3^{-5}

F. Simplify:

$$\frac{3^5 \times 10^5 \times 25}{5^7 \times 6^5} ; \frac{12^4 \times 9^3 \times 4}{6^3 \times 8^2 \times 27}$$

G. A school has brought few saplings to distribute equally among the students of class VII.

The no. of saplings in exponential form is $2^4 \times 3 \times 5 \times 7$. If there are total 105 students in class VII, use laws of exponents to find the no. of saplings each student gets.

H. CASE STUDY

A group of friends decided to embark on a camping trip to explore the wilderness. During their journey, they encountered various challenges that required them to apply their mathematical skills. One such challenge involved estimating the number of bacteria present in a water sample collected from a nearby stream.

(a) If the initial number of bacteria in the water sample was 10,000 and each bacterium doubles in number every hour, how many bacteria will be present after 3 hours?



(b) Upon reaching their campsite, the friends discovered a peculiar plant whose height doubled every day. If the plant was initially 5 cm tall, how tall will it be after 5 days?



(c) If the present height of the plant is 4.6 cm, what was the height of the peculiar plant two days before?