Important questions Of Exponents

Question 1

Evaluate

(i) 2^{-2}

(ii) $(-2)^{-2}$

(iii) $(3/2)^{-5}$

Answer

As we know that

$b^{-n} = 1/b^n$

(i) $2^{-2} = 1/2^2 = 1/4$

(ii) $(-2)^{-2} = 1/(-2)^2 = 1/4$

(iii) $(3/2)^{-5} = 3^{-5}/2^{-5}$

$= 2^5/3^5 = 32/243$

Question 2

Simplify and express the result in power notation with positive exponent.
(i) $(-2)^5 \div (-2)^4$

(ii) $(1/2)^2 \times (2/5)^2$

(iii) $(-5)^2 \times (3/5)$

Answer

(i) $(-2)^5 \div (-2)^4$

$= (-2)^5 / (-2)^4$

$= (-2)^{5-4}$

$= -2$

(ii) $(1/2)^2 \times (2/5)^2$

$= (1/4) \times (4/25)$

= 1/25

iii) $(-5)^2 \times (3/5)$

$= 25 \times (3/5)$

$= 15$

Question 3
Find the value of.

    (i) $(4^0 + 4^{-1}) \times 2^2$

    (ii) $(3^{-1} \times 9^{-1}) \div 3^{-2}$

    (iii) $(11^{-1} + 12^{-1} + 13^{-1})^0$

Answer

    i) $(4^0 + 4^{-1}) \times 2^2$

$= (1 + 1/4) \times 4$
$= 4 + 1 = 5$

    ii) $(3^{-1} \times 9^{-1}) \div 3^{-2}$

    $= [(1/3) \times (1/9)] \div (1/9)$
    $= 1/3$

    iii) $(11^{-1} + 12^{-1} + 13^{-1})^0$

    $= 1$ as $a^0 = 1$

Question 4

Find the value of x here

$(11/9)^3 \times (9/11)^6 = (11/9)^{2x-1}$

Answer

$(11/9)^3 \times (11/9)^{-6} = (11/9)^{2x-1}$

$(11/9)^{3-6} = (11/9)^{2x-1}$

-3=2x-1

Or
x=-1

Question 5
Find the value of m for which $2^m \div 2^{-4} = 4^5$

Answer

$2^m \div 2^{-4} = 4^5$

$2^m \times (1/2^{-4}) = 2^{10}$

$2^{m+4} = 2^{10}$

So m+4=10

m=6

Question 6
Express the following numbers in standard form.

(i) 0.0000000015 (ii) 0.00000001425

(iii) 102000000000000000

Answer

i)   0.0000000015
     $=1.5 \times 10^{-9}$

ii)   0.00000001425
     $=1.425 \times 10^{-8}$

iii)   102000000000000000
     $=1.02 \times 10^{17}$

Question 7
Express the following numbers in usual form.

(i) 34.02×10^{-5} (ii) 9.5×10^{5}

(iii) 9×10^{-4} (iv) 2.0001×10^{8}

Answer

    i) 34.02×10^{-5}
                  $= .0003402$

    ii) 9.5×10^{5}
                  $=950000$

    iii) 9×10^{-4}
                  $=.0009$

    iv) 2.0001×10^{8}
                  $=200010000$