MBA PRO 2025

Quantitative Aptitude

DPP: 2

Basics of Exponents

Q1 Simplify: $2^8 + 2^{10} + 2^{11} + 2^{12} + 2^{13}$
(A) $2^8(62)$ (B) $2^{10}(61)$
(C) 2^8 (61) (D) $2^{10}(62)$

Q2 Simplify: $\frac{5^{10}+5^{11}}{5}$
(A) $5^{10}(5)$ (B) $5^9(6)$
(C) $5^{10}(6)$ (D) $5^9(5)$

Q3 Simplify: $\frac{12^3\times6^2\times2^2\times3^1}{108^2}$
(A) 62 (B) 60
(C) 65 (D) 64

Q4 Simplify: $\frac{0.15\times0.27\times0.5\times0.4}{0.3\times0.12}$
(A) 0.250 (B) 0.225
(C) 0.300 (D) 0.200

Q5 $3^x = 81^y$. Find the value of x in terms of y.
(A) 6y (B) 5y
(C) 4y (D) 2y

Q6 $27^{2x+3} = 3^{3x+6}$, then find the value of x?
(A) 0 (B) -1
(C) -3 (D) 2

Q7 $\frac{2^{(4x+8)}}{2^{(2x+2)}}$ = 4 , Find the value of x?
(A) -2 (B) 2
(C) 0 (D) 1

Q8 Simplify : $\frac{2^{28}-2^{12}}{2^9}$
(A) $2^{19} - 6$ (B) $2^{20} - 7$
(C) $2^{19} - 8$ (D) $2^{18} - 8$

Q9 $3^{3x+2} = 9^{2x+8}$. Find the value of x.
(A) 14 (B) 8
(C) -14 (D) -8

Q10 $\frac{2^{x+4}}{2^{2x+2}} = 8$. Find the value of x.
(A) 1 (B) 2
(C) 0 (D) -1

Q11 If $16 \times \sqrt{7} \times \sqrt[3]{5} = 4^{\mathrm{m}} \times 5^{\mathrm{n}} \times 7^{\mathrm{p}}$. Then $\mathrm{mnp} =$
(A) $\frac{1}{2}$
(B) $\frac{1}{4}$
(C) $\frac{1}{5}$
(D) $\frac{1}{3}$

Q12 $2197 \times 125 = (65)^{3m}$, then $\mathrm{m} =$
(A) 1 (B) 2
(C) 3 (D) 0

Q13 Simplify the expression $((x^{-27})^{\frac{1}{2}})^{\frac{1}{9}}$, x≥0.
(A) $\frac{1}{x^3}$
(B) $\frac{1}{\sqrt[3]{x}}$
(C) $\frac{1}{x\sqrt{x}}$
(D) $\sqrt{(x^3)}$

Q14 Simplify the expression $\sqrt[4]{216x^{-2}y^9 \times \frac{6}{x^6y^{-3}}}$
(A) $6y^3x^2$
(B) $\frac{x^3}{6y^2}$
(C) $\frac{6x^3}{y^2}$
(D) $\frac{6y^3}{x^2}$

Q15 What is the value of $x^{3/2}$ in the equation $3^{(5x+4)} = 729^4$?
(A) 10 (B) 2

(C) 8 (D) 4

Answer Key

Q1	(C)
Q2	(B)
Q3	(D)
Q4	(B)
Q5	(C)
Q6	(B)
Q7	(A)
Q8	(C)
Q9	(C)
Q10	(D)
Q11	(D)
Q12	(A)
Q13	(C)
Q14	(D)
Q15	(C)

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

Take 2^8 as common

$= 2^8(1 + 2^2 + 2^3 + 2^4 + 2^5)$

$= 2^8$ (1 + 4 + 8 +16 + 32)

$= 2^8$ (61)

Video Solution:

Q2 Text Solution:

$=\frac{5^{10}+5^{11}}{5}$

Simplify the above problem by taking 5^{10} as common

$= \frac{5^{10}(1+5)}{5}$

$= 5^9(1 + 5)$

$= 5^9$ (6)

Video Solution:

Q3 Text Solution:

Equate the power of the given equation.

$=\frac{12^3\times6^2\times2^2\times3^1}{108^2}$

Simplify,

$= \frac{12\times12\times12\times6\times6\times2\times2\times3}{12\times12\times9\times9}$

$=\frac{12\times6\times6\times2\times2\times3}{9\times9}$

$=\frac{4\times3\times3\times2\times3\times2\times2\times2\times3}{3\times3\times3\times3}$

$=4 \times 2 \times 2 \times 2 \times 2$

=64

Video Solution:

Q4 Text Solution:

Simplify the above problem as

$= \frac{0.15\times0.27\times0.5\times0.4}{0.3\times0.12}$

$=\frac{0.5\times0.9\times0.3\times0.5\times0.4}{0.4\times0.3}$

$=0.5 \times 0.9 \times 0.5$

= 0.225

Video Solution:

Q5 Text Solution:

Given that

$3^x = 81^y$

Since 81 = 3^4

$3^x = 3^{4y}$

Equating exponents (since bases are equal)

x = 4y

Value of x in terms of y

x = 4y

Video Solution:

Q6 Text Solution:

Given equation:

$27^{2x+3} = 3^{3x+6}$

Since 27 = 3^3

$3^{3(2x+3)} = 3^{3x+6}$

Using exponent properties:

$3^{6x+9} = 3^{3x+6}$

Equating exponents:

6x + 9 = 3x + 6

6x - 3x = 6 - 9

3x = -3

x = -1

Video Solution:

Q7 Text Solution:

Given equation:

$\frac{2^{(4x+8)}}{2^{(2x+2)}} = 4$

Using exponent properties :

$2^{(4x+8-(2x+2))} = 4$

Simplifying:

$2^{(2x+6)} = 4$

Expressing 4 as 2^2

$2^{(2x+6)} = 2^2$

Equating exponents:

2x + 6 = 2

2x = 2 - 6

2x = -4

x = -2

Video Solution:

Q8 Text Solution:

Given equation:

$\frac{2^{28}-2^{12}}{2^9}$

Take 2^{12} as common

$\frac{2^{12}(2^{16}-1)}{2^9}$

Simplifying:

$2^3\left(2^{16}-1\right)$

$2^{19}-2^3$

$2^{19}-8$

Video Solution:

Q9 Text Solution:

Given equation:

$3^{3x+2} = 9^{2x+8}$

expressing 9 as 3^2

$3^{3x+2} = 3^{2(2x+8)}$

Equating exponents:

3x + 2 = 2 (2x + 8)

Simplifying:

3x + 2 = 4x + 16

-16 + 2 = 4x - 3x

-14 = x

x = -14

Video Solution:

Q10 Text Solution:

Given equation:

$\frac{2^{x+4}}{2^{2x+2}} = 8$

Using exponent properties:

$2^{(x+4)-(2x+2)} = 8$

Simplifying:

$2^{-x+2} = 8$

Expressing $8 = 2^3$

$2^{-x+2} = 2^3$

Equating exponents:

-x + 2 = 3

x = -3 +2

x = -1

Video Solution:

Q11 Text Solution:

Given, $16 \times \sqrt{7} \times \sqrt[3]{5} = 4^{\mathrm{m}} \times 5^{\mathrm{n}} \times 7^{\mathrm{p}}$ or

$4^2 \times 7^{\frac{1}{2}} \times 5^{\frac{1}{3}} = 4^{\mathrm{m}} \times 5^{\mathrm{n}} \times 7^{\mathrm{p}}$ Equating the power of similar bases, we get

$\mathrm{m} = 2, \mathrm{n} = \frac{1}{3}$ or $\mathrm{p} = \frac{1}{2}$

So, $mnp = \frac{1}{3}$

Video Solution:

Q12 Text Solution:

$$2197 \times 125 = (65)^{3\,\mathrm{m}}$$
$$\text{or } 13^3 \times 5^3 = (13 \times 5)^{3\,\mathrm{m}}$$
$$\text{or } 13^3 \times 5^3 = \left(13^{3\,\mathrm{m}} \times 5^{3\,\mathrm{m}}\right)$$
$$\text{or } 3\,\mathrm{m} = 3$$
$$\text{or } \mathrm{m} = 1$$

Video Solution:

Q13 Text Solution:

$((x^{-27})^{\frac{1}{2}})^{\frac{1}{9}} = ((x^{-27 \times \frac{1}{2}})^{\frac{1}{9}}$

$= (x^{-\frac{27}{2}})^{\frac{1}{9}}$

$= x^{-\frac{27}{2} \times \frac{1}{9}}$

$= x^{-\frac{3}{2}}$

$= \frac{1}{x^{\frac{3}{2}}}$

$= \frac{1}{x\sqrt{x}}$

Hence, option (3) is the correct answer.

Video Solution:

Q14 Text Solution:

The given expression $\sqrt[4]{216x^{-2}y^9 \times \frac{6}{x^6y^{-3}}}$ can be written as

$= \sqrt[4]{216 \times 6 \times \frac{x^{-2}y^9}{x^6y^{-3}}}$

$= \sqrt[4]{6 \times 6 \times 6 \times 6 \times \frac{x^{-2}y^9}{x^6y^{-3}}}$

$= 6\sqrt[4]{\frac{y^{9+3}}{x^{6+2}}}$

$= 6\sqrt[4]{\frac{y^{12}}{x^8}}$

$= 6 \times \frac{y^{12\times\frac{1}{4}}}{x^{8\times\frac{1}{4}}}$

$= \frac{6y^3}{x^2}$

Thus, option (4) is the correct answer.

Video Solution:

Q15 Text Solution:

The given equation is $3^{(5x+4)} = 729^4$

Therefore, $3^{(5x+4)} = (3^6)^4$

$3^{5x+4} = 3^{24}$

$5x+4 = 24$

$5x = 20$

$x = 4$

Then,

$x^{\frac{3}{2}} = 4^{\frac{3}{2}} = 8$

Option (3) is correct.

Video Solution: