

यदि किसी संख्या  $p$  को  $n$  बार  $P$  से ही गुणा किया जाए तो गुणनफल को  $p$  का  $n$  वां घात कहते हैं और इसे  $p^n$  लिखा जाता है।  $p^n$  में  $p$  को आधार एवं  $n$  को घातांक कहा जाता है।

### Power के नियम

(i) $a^m \times a^n = a^{m+n}$	(ii) $\frac{a^m}{a^n} = a^{m-n}$
(iii) $(a^m)^n = a^{m \times n}$	(iv) $a^{-n} = \frac{1}{a^n}$
(v) $a^{-\frac{1}{n}} = \frac{1}{a^{\frac{1}{n}}}$	(vi) $a^0 = 1$
(vii) $\sqrt[n]{a} = (a)^{\frac{1}{n}}$	(viii) $\sqrt[n]{a^m} = (a)^{\frac{m}{n}}$
(ix) $a^{\frac{m}{n}} = (a^{\frac{1}{n}})^m = (a^{\frac{1}{m}})^n$	(x) $\frac{1}{a} = a^{-1}$
(xi) यदि $a^m = a^n$ हो, तो $m = n$	(xii) यदि $a^p = b^p$ हो, तो $a = b$

### इन्हें भी याद रखें

$2^3 = 8$	$2^9 = 512$	$2^7 = 128$
$2^6 = 64$	$3^3 = 27$	$3^4 = 81$
$3^5 = 243$	$5^5 = 3125$	$5^4 = 625$
$2^8 = 256$	$4^4 = 256$	$9^3 = 729$
$6^3 = 216$	$7^3 = 343$	$7^4 = 2401$

### नियम पर आधारित प्रश्न

#### TYPE - 1

1.  $5^3 \times 5^2 \times 125^2 = ?$

**Speedy Solution :-**

$$5^3 \times 5^2 \times 125^2 = 5^3 \times 5^2 \times (5^3)^2 \\ = 5^3 \times 5^2 \times 5^6 = 5^{3+2+6} = 5^{11}$$

2.  $(324)^{0.18} \times (324)^{0.18} \times (324)^{0.14} = ?$

**Speedy Solution :-**

$$(324)^{0.18} \times (324)^{0.18} \times (324)^{0.14} \\ = (324)^{0.18 + 0.18 + 0.14} \\ = (324)^{0.5} = (324)^{\frac{1}{2}} = (18)^{2 \times \frac{1}{2}} = 18$$

3.  $\sqrt[3]{(27)^4} = ?$

**Speedy Solution :-**

$$\sqrt[3]{(27)^4} = (27)^{\frac{4}{3}} = (3)^{3 \times \frac{4}{3}} = 3^4 = 81$$

4.  $4^{3.5} : 2^5 = ?$

**Speedy Solution :-**

$$4^{3.5} : 2^5 = \frac{(2^2)^{3.5}}{2^5} = \frac{(2)^7}{(2)^5} = 2^{7-5} = 2^2 = 4$$

#### TYPE - 2

5. यदि  $2^{x-1} = 4$  तो  $x$  का मान निकालें ?

**Speedy Solution :-**

$$2^{x-1} = (2)^2 \Rightarrow x-1 = 2$$

$$\therefore x = 2+1 = 3$$

6. यदि  $(16)^{x+1} = \frac{64}{4^x}$  तो  $x = ?$

**Speedy Solution :-**

$$\therefore (16)^{x+1} = \frac{64}{4^x}$$

$$\Rightarrow (4^2)^{x+1} = (4)^3 \div 4^x \Rightarrow (4)^{2x+2} = 4^{3-x}$$

$$\Rightarrow 2x+2 = 3-x$$

$$\Rightarrow 2x+x = 3-2$$

$$\Rightarrow 3x = 1$$

$$\therefore x = \frac{1}{3}$$

7.  $(\sqrt{3})^5 \times 9^2 = 3^a \times 3\sqrt{3}$  तो  $a = ?$

**Speedy Solution :-**

$$\therefore (\sqrt{3})^5 \times 9^2 = 3^a \times 3\sqrt{3}$$

$$\Rightarrow (3)^{\frac{5}{2}} \times 3^4 = 3^a \times 3 \times (3)^{\frac{1}{2}} \Rightarrow 3^{\frac{5}{2}+4} = 3^{a+1+\frac{1}{2}}$$

$$\Rightarrow \frac{5+8}{2} = \frac{2a+2+1}{2}$$

$$\Rightarrow \frac{13}{2} = \frac{2a+3}{2}$$

$$\Rightarrow 13 = 2a+3$$

$$\Rightarrow 13-3 = 2a$$

$$\therefore a = \frac{10}{2} = 5$$

**TYPE - 3**

8.  $(2^m)^m = 512$  तो  $m = ?$

**Speedy Solution :-**

$$(2^m)^m = 512$$

$$\Rightarrow (2^m)^2 = (2^9) \Rightarrow m^2 = 9$$

$$\therefore m = \sqrt{9} = 3$$

9.  $\sqrt{2^x} = 64$  तो  $x = ?$

**Speedy Solution :-**

$$\sqrt{2^x} = 64$$

$$\Rightarrow 2^{x/2} = 2^6 \Rightarrow \frac{x}{2} = 6$$

$$\therefore x = 12$$

10.  $2^{3^2} - (2^3)^2 = ?$

**Speedy Solution :-**

$$2^{3^2} - (2^3)^2 = 2^9 - (2^3)^{2 \times 2} = 2^9 - 2^6 = 512 - 64 = 448$$

11.  $9^{3.04} : 9^{2.04} = ?$

**Speedy Solution :-**

$$9^{3.04} : 9^{2.04} = \frac{9^{3.04}}{9^{2.04}} = (9)^{3.04 - 2.04} = (9)^1 = 9$$

**TYPE - 4**

12.  $\sqrt[3]{64 \times (125)^2} = ?$

**Speedy Solution :-**

$$\begin{aligned} \sqrt[3]{64 \times (125)^2} &= \sqrt[3]{4^3 \times (5^3)^2} \\ &= \sqrt[3]{4^3 \times 5^3 \times 5^3} = 4 \times 5 \times 5 = 100 \end{aligned}$$

13.  $\sqrt[5]{(32)^{-3}} = ?$

**Speedy Solution :-**

$$\sqrt[5]{(32)^{-3}} = (32)^{-3/5} = (2^5)^{-3/5} = (2)^{-3} = \frac{1}{2^3} = \frac{1}{8}$$

**TYPE - 5**

14. यदि  $2^{x-1} + 2^{x+1} = 320$  हो, तो  $x$  का मान निकालें ?

**Speedy Solution :-**

$$2^{x-1} + 2^{x+1} = 320$$

$$\Rightarrow \frac{2^x}{2} + 2^x \times 2 = 320 \Rightarrow 2^x \left( \frac{1}{2} + 2 \right) = 320$$

$$\Rightarrow 2^x \left( \frac{1+4}{2} \right) = 320 \Rightarrow 2^x \times \frac{5}{2} = 320$$

$$\Rightarrow 2^x = \frac{320 \times 2}{5} \Rightarrow 2^x = 128$$

$$\Rightarrow 2^x = 2^7 \therefore x = 7$$

15. यदि  $3^x - 3^{x-1} = 18$  हो, तो  $x$  का मान निकालें ?

**Speedy Solution :-**

$$3^x - 3^{x-1} = 18 \Rightarrow 3^x - \frac{3^x}{3} = 18$$

$$\Rightarrow 3^x \left( 1 - \frac{1}{3} \right) = 18 \Rightarrow 3^x \left( \frac{3-1}{3} \right) = 18$$

$$\Rightarrow 3^x = \frac{18 \times 3}{2} \Rightarrow 3^x = 27$$

$$\Rightarrow 3^x = 3^3 \therefore x = 3$$

16. यदि  $\left( \frac{a}{b} \right)^{x-1} = \left( \frac{b}{a} \right)^{x-3}$  हो, तो  $x$  का मान निकालें ?

**Speedy Solution :-**

$$\left( \frac{a}{b} \right)^{x-1} = \left( \frac{b}{a} \right)^{x-3}$$

$$\Rightarrow \left( \frac{a}{b} \right)^{x-1} = \left( \frac{a}{b} \right)^{3-x} \Rightarrow x-1 = 3-x$$

$$\Rightarrow 2x = 4 \therefore x = 2$$

17.  $\sqrt{x^{-1}y} \cdot \sqrt{y^{-1}z} \cdot \sqrt{z^{-1}x} = ?$

**Speedy Solution :-**

$$\sqrt{x^{-1}y} \cdot \sqrt{y^{-1}z} \cdot \sqrt{z^{-1}x} = \sqrt{\frac{y}{x}} \cdot \sqrt{\frac{z}{y}} \cdot \sqrt{\frac{x}{z}} = 1$$

18.  $\left( \frac{m^a}{m^b} \right)^{1/ab} \times \left( \frac{m^c}{m^a} \right)^{1/ca} \times \left( \frac{m^b}{m^c} \right)^{1/bc}$  को सरल करने पर क्या प्राप्त होगा।

**Speedy Solution :-**

$$\text{प्रश्नानुसार, } (m^{a-b})^{1/ab} \times (m^{c-a})^{1/ca} \times (m^{b-c})^{1/bc}$$

$$= m^{(a-b)/ab} \times m^{(c-a)/ca} \times m^{(b-c)/bc}$$

$$= m^{\left( \frac{1}{b} - \frac{1}{a} \right) + \left( \frac{1}{a} - \frac{1}{c} \right) + \left( \frac{1}{c} - \frac{1}{b} \right)} = m^0 = 1$$



## PREVIOUS YEAR'S RRB'S QUESTIONS

1. यदि  $2^{x+6} = 8^{x+1}$  हो, तो  $x$  का मान है -

- (A)  $\frac{3}{2}$  (B)  $\frac{5}{2}$  (C)  $\frac{7}{2}$  (D)  $\frac{9}{2}$

(RRB चेन्नई T.C., 24-4-2005)

**Speedy Solution :** (A)

∵ आधार समान होने पर Power भी समान होता है

$$\therefore 2^{x+6} = (2^3)^{x+1}$$

$$\Rightarrow x+6 = 3x+3 \quad \Rightarrow 2x = 3$$

$$\therefore x = \frac{3}{2}$$

2.  $2^{2^x} = 256$ , हो, तो  $x$  का मान निकालें ?

- (A) 4 (B) 3 (C) 2 (D) 8

(RRB अहमदाबाद ASM, 29-8-2004)

**Speedy Solution :** (B)

$$2^{2^x} = 256,$$

$$\Rightarrow 2^{2^x} = 2^{2^3} \quad \Rightarrow 2^x = 2^3 \quad \therefore x = 3$$

3. समीकरण  $3^x - 2.3^{x+2} + 51 = 0$  में  $x$  का मान है -

- (A) 2 (B) 1 (C) 3 (D) 0

(RRB कोलकाता T.C./C.C., 2004)

**Speedy Solution :** (B)

$$\Rightarrow 3^x - 2.3^x \times 3^2 + 51 = 0$$

$$\Rightarrow a - 18a + 51 = 0 \quad [\text{माना } 3^x = a]$$

$$\Rightarrow -17a = -51$$

$$\therefore a = 3 \quad \therefore 3^x = a$$

$$\Rightarrow 3^x = 3^1 \quad \therefore x = 1$$

4. यदि  $2^a + 3^b = 17$  तथा  $2^{a+2} - 3^{b+1} = 5$  हो, तो  $a$  तथा  $b$  का मान है -

- (A) 4, 3 (B) 3, 2 (C) 2, 3 (D) 1, 0

(RRB मिकन्दराबाद ASM, 2004)

**Speedy Solution :** (B)

$$2^a + 3^b = 17$$

$$\text{पुनः } 2^a \times 2^2 - 3^b \times 3^1 = 5$$

$$\Rightarrow 2^a \times 4 - 3^b \times 3 = 5$$

$$[\text{माना } 2^a = x \text{ तथा } 3^b = y]$$

$$\therefore x + y = 17 \quad (i)$$

$$4x - 3y = 5 \quad (ii)$$

दोनों समीकरण को हल करने पर,

$$x = 8, y = 9$$

$$\therefore 2^8 = 2^3 \text{ तथा } 3^9 = 3^2$$

$$\therefore a = 3 \text{ तथा } b = 2$$

5. समीकरण  $4^x - 3.2^{x+2} + 32 = 0$  में  $x$  का मान है -

- (A) 1, 2, 3 (B) 1, 2 (C) 1, 3 (D) 8, 4

(RRB कोलकाता/भुवनेश्वर TC, 2003)

**Speedy Solution :** (D)

$$4^x - 3.2^{x+2} + 32 = 0$$

$$\Rightarrow (2^x)^2 - 3 \times 2^x \times 2^2 + 32 = 0$$

$$\Rightarrow (2^x)^2 - 12 \cdot 2^x + 32 = 0$$

$$\text{माना } 2^x = a$$

$$\Rightarrow a^2 - 12a + 32 = 0$$

$$\Rightarrow a^2 - 8a - 4a + 32 = 0$$

$$\Rightarrow a(a-8) - 4(a-8) = 0$$

$$\therefore a = 8, 4$$

6. यदि  $3^{x+y} = 81$  और  $81^{\frac{x-y}{4}} = 3$  है, तो  $x$  तथा  $y$  का मान है -

- (A)  $\frac{17}{8}, \frac{9}{8}$  (B)  $\frac{17}{18}, \frac{11}{8}$  (C)  $\frac{5}{2}, \frac{3}{2}$  (D)  $\frac{17}{8}, \frac{15}{8}$

(RRB कोलकाता G.G., 2002)

**Speedy Solution :** (C)

$$3^{x+y} = (3^4)$$

$$\therefore x+y = 4 \quad \dots(i)$$

$$\text{पुनः } (3^4)^{\frac{x-y}{4}} = 3^1$$

$$\therefore x-y = 1 \quad \dots(ii)$$

समी. (i) तथा (ii) को हल करने पर,

$$x = \frac{5}{2} \text{ तथा } y = \frac{3}{2}$$

7. यदि  $a^x = b$ ,  $b^y = c$  एवं  $c^z = a$  तो  $xyz$  का मान है -

- (A) 0 (B) 1 (C) -1 (D) 2

(RRB जम्मू PWI Clerk, 2001)

**Speedy Solution : (B)**

$$\therefore b^y = c$$

$$\Rightarrow (a^x)^y = c \Rightarrow \{(c^z)^x\}^y = c^1$$

$$\Rightarrow c^{xyz} = c^1 \therefore xyz = 1$$

8. यदि  $7^{x-\frac{1}{2}} = 7 \left[ 7^{2(1-x)} \right]$ , तो  $x$  का मान क्या है-

- (A)  $\frac{15}{4}$  (B)  $\frac{5}{4}$  (C)  $\frac{3}{4}$  (D)  $\frac{9}{4}$

(RRB भोपाल ASM, 1999)

**Speedy Solution : (B)**

$$\therefore 7^{x-\frac{1}{2}} = 7 \left[ 7^{2(1-x)} \right]$$

$$\Rightarrow \frac{4x-3}{7} = 7^{2-2x} \Rightarrow 7^{\left(\frac{4x-3}{4}-1\right)} = 7^{(2-2x)}$$

$$\Rightarrow \frac{4x-7}{4} = 2-2x \Rightarrow 4x-7 = 4(2-2x)$$

$$\Rightarrow 4x-7 = 8-8x \Rightarrow 4x+8x = 8+7$$

$$\Rightarrow 12x = 15 \therefore x = \frac{15}{12} = \frac{5}{4}$$

9. यदि  $5^{x+3} = (25)^{(3x-4)}$  तो  $x$  का मान होगा -

- (A)  $\frac{5}{11}$  (B)  $\frac{11}{3}$  (C)  $\frac{11}{5}$  (D)  $\frac{13}{5}$

(RRB मय्यड़ ASM, 1999)

**Speedy Solution : (C)**

$$5^{x+3} = (25)^{(3x-4)}$$

$$\Rightarrow 5^{x+3} = (5)^{2(3x-4)} \Rightarrow x+3 = 2(3x-4)$$

$$\Rightarrow x+3 = 6x-8 \Rightarrow 6x-x = 3+8$$

$$\Rightarrow 5x = 11 \therefore x = \frac{11}{5}$$

10. यदि  $a^x = b^y = c^z$  तथा  $b^2 = ac$  तो  $y$  का मान होगा -

- (A)  $\frac{xz}{x+z}$  (B)  $\frac{xz}{2(x+z)}$  (C)  $\frac{xz}{2(z+x)}$  (D)  $\frac{2xz}{(x+z)}$

(RRB मय्यड़ ASM, 1998)

**Speedy Solution : (D)**

$$\text{माना } a^x = b^y = c^z = k$$

$$\therefore a = k^{\frac{1}{x}}, b = k^{\frac{1}{y}}, c = k^{\frac{1}{z}}$$

$$\text{पुनः } b^2 = ac$$

$$\Rightarrow \left(k^{\frac{1}{y}}\right)^2 = k^{\frac{1}{x}} \times k^{\frac{1}{z}} \Rightarrow k^{\frac{2}{y}} = k^{\frac{1}{x} + \frac{1}{z}}$$

$$\Rightarrow k^{\frac{2}{y}} = k^{\frac{z+x}{xz}} \Rightarrow \frac{2}{y} = \frac{z+x}{xz}$$

$$\therefore y = \frac{2xz}{x+z}$$

11. यदि  $3^{(x-y)} = 27$  तथा  $3^{(x+y)} = 243$  तो  $x$  का मान है -

- (A) 0 (B) 2 (C) 4 (D) 6

(RRB गोरखपुर ESM, 2003)

**Speedy Solution : (C)**

$$3^{(x-y)} = 27$$

$$\Rightarrow 3^{(x-y)} = (3)^3$$

$$\therefore x-y = 3 \quad \dots (i)$$

$$\text{पुनः } 3^{(x+y)} = 243$$

$$\Rightarrow 3^{(x+y)} = (3)^5$$

$$\therefore x+y = 5 \quad \dots (ii)$$

समी- (i) तथा (ii) को हल करे पर,

$$x = 4 \text{ तथा } y = 1$$

12. यदि  $4^x - 4^{x-1} = 24$ , तो  $(2x)^x$  बराबर है-

- (A) 25 (B) 125 (C)  $\sqrt{5}$  (D)  $25\sqrt{5}$

(RRB भुवनेश्वर SM-III, 2001)

**Speedy Solution : (D)**

$$4^x - 4^{x-1} = 24$$

$$\Rightarrow 4^x - 4^x \times \frac{1}{4} = 24 \Rightarrow 4^x \left(1 - \frac{1}{4}\right) = 24$$

$$\Rightarrow 4^x \times \frac{3}{4} = 24 \Rightarrow 4^x = \frac{24 \times 4}{3} = 32$$

$$\Rightarrow (2)^{2x} = (2)^5 \Rightarrow 2x = 5$$

$$\therefore x = \frac{5}{2}$$

$$\text{पुनः } (2x)^x = \left(2 \times \frac{5}{2}\right)^{\frac{5}{2}} = (5)^{\frac{5}{2}} = \sqrt{5^5} = \sqrt{5^2 \times 5^2 \times 5} = 25\sqrt{5}$$



13. यदि  $\sqrt{x^6} = 64$ , तो  $x$  का मान क्या होगा -

- (A) 2 (B) 4 (C) 8 (D) 12

**Speedy Solution : (B)**

$$\sqrt{x^6} = 64$$

$$\Rightarrow x^6 = (64)^2 \Rightarrow x^6 = \{(4)^3\}^2$$

$$\Rightarrow x^6 = 4^6 \therefore x = 4$$

14.  $(256)^{.16} \times (256)^{.09}$  का मान है -

- (A) 64 (B) 4 (C) 8 (D) 16

**(RRB भोपाल J. Clerk, 1999)**

**Speedy Solution : (B)**

$$(256)^{.16} \times (256)^{.09} = (256)^{(.16) + (.09)}$$

$$= 256^{.25} = 256 \frac{25}{100} = 256 \frac{1}{4}$$

$$= (4)^{4 \times \frac{1}{4}} = 4$$

15. यदि  $a^x = bc$ ,  $b^y = ca$  एवं  $c^z = ab$  तो  $\frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{1+z}$  का मान है -

- (A) 0 (B) 1 (C) abc (D)  $a+b+c$

**(RRB कोलकाता Technical, 1999)**

**Speedy Solution : (B)**

$$a^x = bc$$

दोनों ओर  $\log$  लेने पर

$$\log a^x = \log bc$$

$$\Rightarrow x \log a = \log bc$$

$$\therefore x = \frac{\log(bc)}{\log(a)}$$

इसी प्रकार,

$$b^y = ca$$

$$\therefore y = \frac{\log(ac)}{\log(b)}$$

$$\text{तथा } c^z = ab$$

$$\therefore z = \frac{\log(ab)}{\log(c)}$$

पुनः

$$\frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{1+z} = \frac{\log(a)}{\log(abc)} + \frac{\log(b)}{\log(abc)} + \frac{\log(c)}{\log(abc)}$$

$$\left[ \frac{1}{1+x} = \frac{1}{1 + \frac{\log(bc)}{\log(a)}} = \frac{1}{\frac{\log(a) + \log(bc)}{\log(a)}} = \frac{\log(a)}{\log(abc)} \right]$$

$$= \frac{\log(a) + \log(b) + \log(c)}{\log(abc)} = \frac{\log(abc)}{\log(abc)} = 1$$

16.  $\left[ \left( \sqrt[5]{x^{-3/5}} \right)^{-5/3} \right]^5 = ?$

- (A)  $x$  (B)  $\frac{1}{x}$  (C)  $x^2$  (D)  $x^4$

**(RRB बंगलौर, 1999)**

**Speedy Solution : (A)**

$$\left[ \left( \sqrt[5]{x^{-3/5}} \right)^{-5/3} \right]^5 = \left( \sqrt[5]{x^{-3/5}} \right)^{-5/3 \times 5}$$

$$= \left\{ \left( x^{-3/5} \right)^{1/5} \right\}^{-25} = (x)^{-3/5 \times 1/5 \times -25} = x^1 = x$$

17.  $2^{(-2)^2}$  बराबर है -

- (A)  $\frac{1}{8}$  (B) -8 (C)  $-\frac{1}{8}$  (D) 16

**(RRB त्रिवेन्द्रम ASM, 2000)**

**Speedy Solution : (D)**

$$2^{(-2)^2} = 2^4 = 16$$

18. यदि  $1.125 \times 10^k = 0.001125$  तो 'k' का मान होगा -

- (A) -4 (B) -3 (C) -2 (D) -1

**(RRB अजमेर डिजिटल ड्राइवर, 1998)**

**Speedy Solution : (B)**

$$1.125 \times 10^k = 0.001125$$

$$\Rightarrow 10^k = \frac{0.001125}{1.125} = \frac{1.125}{1125} \Rightarrow 10^k = \frac{1125}{1125000} = \frac{1}{1000}$$

$$\Rightarrow 10^k = 10^{-3} \therefore k = -3$$

19. यदि  $4^{2x} = \frac{1}{32}$  हो, तो  $x$  का मान होगा -

- (A)  $\frac{5}{4}$  (B)  $\frac{4}{5}$  (C)  $\frac{3}{5}$  (D)  $-\frac{5}{4}$

**(RRB महेन्द्रगढ़, पटना ASM, 1998)**

**Speedy Solution : (D)**

$$4^{2x} = \frac{1}{32}$$

$$\Rightarrow (2)^{4x} = 2^{-5} \quad \Rightarrow 4x = -5$$

$$\therefore x = \frac{-5}{4}$$

20. यदि  $2^x - 2^{x-1} = 16$  हो, तो  $x$  का मान कितना है -

- (A) 1 (B) 5 (C) 3 (D) 2

(RRB कोलकाता T.C./C.C., 2004)

**Speedy Solution : (B)**

$$2^x - 2^{x-1} = 16 \quad \Rightarrow 2^x - 2^x \times \frac{1}{2} = 16$$

$$\Rightarrow 2^x \left(1 - \frac{1}{2}\right) = 16 \quad \Rightarrow 2^x \left(\frac{2-1}{2}\right) = 16$$

$$\Rightarrow 2^x \times \frac{1}{2} = 16 \quad \Rightarrow 2^x = 32$$

$$\Rightarrow 2^x = 2^5 \quad \therefore x = 5$$

21. यदि  $\frac{\left(x + \frac{1}{y}\right)^a \left(x - \frac{1}{y}\right)^b}{\left(y + \frac{1}{x}\right)^a \left(y - \frac{1}{x}\right)^b}$  बराबर है -

(A)  $\left(\frac{x}{y}\right)^{a \times b}$

(B)  $\left(\frac{x}{y}\right)^{a+b}$

(C)  $\frac{x}{y}$

(D) इनमें से कोई नहीं

(RRB सिकन्दराबाद ASM, 2004)

**Speedy Solution : (B)**

प्रश्नानुसार,

$$\frac{\left(\frac{xy+1}{y}\right)^a \times \left(\frac{xy-1}{y}\right)^b}{\left(\frac{xy+1}{x}\right)^a \times \left(\frac{xy-1}{x}\right)^b} = \frac{\left(\frac{xy+1}{y}\right)^a \times \left(\frac{xy-1}{y}\right)^b}{\left(\frac{xy+1}{x}\right)^a \times \left(\frac{xy-1}{x}\right)^b}$$

$$= \frac{(xy+1)^a \times (xy-1)^b}{y^{a+b}} \times \frac{x^{(a+b)}}{(xy+1)^a \times (xy-1)^b}$$

$$= \frac{x^{(a+b)}}{y^{(a+b)}} = \left(\frac{x}{y}\right)^{a+b}$$

22.  $(16)^{0.36} \times (256)^{0.07}$  बराबर है -

- (A) 2 (B) 3 (C) 4 (D) 5

(RRB कोलकाता G.G., 2002)

**Speedy Solution : (C)**

$$(16)^{0.36} \times (256)^{0.07}$$

$$= (2)^{4 \times 0.36} \times (2)^{8 \times 0.07}$$

$$= (2)^{1.44} \times (2)^{0.56}$$

$$= (2)^{1.44+0.56} = 2^{2.00} = 4$$

23.  $a^m + a^n = ?$  में ? का मान है -

- (A)  $a^{m+n}$  (B)  $a^{m-n}$  (C)  $a^{mn}$  (D)  $a^{\frac{m}{n}}$

(RRB जम्मू Group D., 2003)

**Speedy Solution : (B)**

घातांक के नियम से,  $a^m + a^n = a^{m-n}$

24.  $a^0$  का मान है -

- (A) 0 (B) 1 (C) a (D) -a

(RRB चंडीगढ़ T.C./C.C., 2003)

**Speedy Solution : (B)**

$a^0 = 1$  होता है

25.  $(0.00032)^{0.6}$  का मान क्या है ?

- (A) 0.8 (B) 0.08 (C) 0.008 (D) इनमें कोई नहीं

(RRB डी० एम० आर० सी० A.S.M., 2002)

**Speedy Solution : (C)**

$$(.00032)^{0.6} = \left(\frac{32}{100000}\right)^{\frac{6}{10}}$$

$$= \left(\frac{2 \times 2 \times 2 \times 2 \times 2}{10 \times 10 \times 10 \times 10 \times 10}\right)^{\frac{3}{5}} = \left[\left(\frac{2}{10}\right)^5\right]^{\frac{3}{5}} = \left(\frac{2}{10}\right)^{5 \times \frac{3}{5}}$$

$$= (0.2)^3 = 0.2 \times 0.2 \times 0.2 = 0.008$$

26.  $(16^{0.16} \times 2^{0.36})$  किसके बराबर है ?

- (A) 64 (B) 16 (C) 2 (D)  $\frac{1}{2}$

(RRB भोपाल G.G./Clerical, 2001)

**Speedy Solution : (C)**

$$(16^{0.16} \times 2^{0.36}) = 16^{\frac{16}{100}} \times 2^{\frac{36}{100}} \left[ (x^m)^n = x^{mn} \text{ से} \right]$$

$$= 2^{\frac{4 \times 16}{100}} \times 2^{\frac{36}{100}} = 2^{\frac{64}{100}} \times 2^{\frac{36}{100}}$$

$$= 2^{\frac{64+36}{100}} = 2^{\frac{100}{100}} = 2^1 = 2$$