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1. Find:

(i)$64^{1/2}$

Solution:

$64^{1/2} = (8\times8)^{1/2}$

$= (8^2)^{½}$

$= 8^1$ [∵2×1/2 = 2/2 =1]

$= 8$

(ii)$32^{1/5}$

Solution:

$32^{1/5} = (2^5)^{1/5}$

$= (2^5)^{⅕}$

$= 2^1$ [∵5×1/5 = 1]

$= 2$

(iii)$125^{1/3}$

Solution:

$(125)^{1/3} = (5\times5\times5)^{1/3}$

$= (5^3)^{⅓}$

$= 5^1$ (3×1/3 = 3/3 = 1)

$= 5$

2. Find:

(i) $9^{3/2}$

Solution:

$9^{3/2} = (3\times3)^{3/2}$

$= (3^2)^{3/2}$

$= 3^3$ [∵2×3/2 = 3]

$=27$

(ii) $32^{2/5}$

Solution:

$32^{2/5} = (2\times2\times2\times2\times2)^{2/5}$

$= (2^5)^{2/5}$

$= 2^2$ [∵5×2/5= 2]

$= 4$

(iii)$16^{3/4}$

Solution:

$16^{3/4} = (2\times2\times2\times2)^{3/4}$

$= (2^4)^{3/4}$

$= 2^3$ [∵4×3/4 = 3]

= 8

(iv) $125^{-1/3}$

$125^{-1/3} = (5\times5\times5)^{-1/3}$

$= (5^3)^{-1/3}$

$= 5^{-1}$ [$\because 3\times-1/3 = -1$]

$= 1/5$

3. Simplify:

(i) $2^{2/3}\times2^{1/5}$

Solution:

$2^{2/3}\times2^{1/5} = 2^{(2/3)+(1/5)}$ [$\because$Since, $a^m\times a^n=a^{m+n}$____ Laws of exponents]

$= 2^{13/15}$ [$\because 2/3 + 1/5 = (2\times5+3\times1)/(3\times5) = 13/15$]

(ii) $(1/3^3)^7$

Solution:

$(1/3^3)^7 = (3^{-3})^7$ [$\because$Since,$(a^m)^n = a^{m\ x\ n}$____ Laws of exponents]

$= 3^{-27}$

(iii) $11^{1/2}/11^{1/4}$

Solution:

$11^{1/2}/11^{1/4} = 11^{(1/2)-(1/4)}$

$= 11^{1/4}$ [$\because(1/2) - (1/4) = (1\times4-2\times1)/(2\times4) = 4-2)/8 = 2/8 = ¼$]

(iv) $7^{1/2}\times8^{1/2}$

Solution:

$7^{1/2}\times8^{1/2} = (7\times8)^{1/2}$ [$\because$Since, $(a^m\times b^m = (a\times b)^m$ ____ Laws of exponents

$= 56^{1/2}$