EXAM PAPERS PRACTICE

Indices

Question Paper

Question 1

Find the value of

(a) $(\sqrt{5})^8$, [1]

(b) $\left(\frac{1}{27}\right)^{-\frac{2}{3}}$. [1]

Question 2

(a) Find the value of

(i) $\left(\frac{1}{4}\right)^{0.5}$, [1]

(ii) $(-8)^{\frac{2}{3}}$. [1]

(b) Use a calculator to find the decimal value of $\frac{\sqrt{29-3\times 32^{0.4}}}{3}$. [1]

Question 3

Simplify the following.

(a) $(4pq^2)^3$ [2]

(b) $(16x^8)^{-\frac{1}{4}}$ [2]

Question 4

$a \times 10^7 + b \times 10^6 = c \times 10^6$

Find c in terms of a and b.
Give your answer in its simplest form. [2]

Question 5

$3^{x} \times 9^{4} = 3^{n}$

Find n in terms of x. [2]

Question 6

Simplify $\frac{5}{8}x^{\frac{3}{2}} \div \frac{1}{2}x^{-\frac{5}{2}}$. [2]

Question 7

Find the value of n in each of the following statements.

(a) $32^{n}=1$ [1]

(b) $32^{n}=2$ [1]

(c) $32^{n}=8$ [1]

Question 8

Simplify

(a) $\left(\frac{x^{27}}{27}\right)^{\frac{2}{3}}$, [2]

(b) $\left(\frac{x^{-2}}{4}\right)^{-\frac{1}{2}}$. [2]

Question 9

Find the **exact** value of

(a) 3^{-2}, [1]

(b) $\left(1\frac{7}{9}\right)^{\frac{1}{2}}$. [2]

Question 10

(a) Simplify $x^8 \div x^2$. [1]

(b) Simplify $\left(\frac{x^6}{27}\right)^{\frac{1}{3}}$. [2]

Question 11

(a) $(2^{24})^{\frac{1}{2}} = p^4$

Find the value of p. [2]

(b) Simplify $\dfrac{q^2 + q^2}{q^{\frac{1}{4}} \times q^{\frac{1}{4}}}$. [3]

Question 12

Calculate $\dfrac{\sqrt[3]{16}}{1.3^2}$. [1]

Question 13

(a) Simplify $(3125t^{125})^{\frac{1}{5}}$. [2]

(b) Find the value of p when $3^p = \frac{1}{9}$. [1]

(c) Find the value of w when $x^{72} \div x^w = x^8$. [1]

Question 14

Simplify.

$3x^2y^3 \times x^4y$ [2]

Question 15

(a) $3^x = \sqrt[4]{3^5}$

Find the value of x. [1]

(b) Simplify $(32y^{15})^{\frac{2}{5}}$. [2]

Question 16

(a) Simplify $(64q^{-2})^{\frac{1}{2}}$. [2]

(b) $5^7 \div 5^9 = p^2$

Find p. [2]

Question 17

Write $(27x^{12})^{\frac{1}{3}}$ in its simplest form. [2]

Question 18

(a) $\left(\frac{3}{8}\right)^{\frac{3}{8}} \times \left(\frac{3}{8}\right)^{\frac{1}{8}} = p^q$

Find the value of p and the value of q. [2]

(b) $5^{-3} + 5^{-4} = k \times 5^{-4}$

Find the value of k. [2]

Question 19

Simplify $(256w^{256})^{\frac{1}{4}}$. [2]

Question 20

Find the values of m and n.

(a) $2^{m} = 0.125$ [2]

(b) $2^{4n} \times 2^{2n} = 512$ [2]

Question 21

Find the value of $\left(\frac{27}{8}\right)^{-\frac{4}{3}}$.

Give your answer as an exact fraction. [2]

Question 22

(a) Find m when $4^m \times 4^2 = 4^{12}$. [1]

(b) Find p when $6^p \div 6^5 = \sqrt{6}$. [1]

Question 23

Simplify

(a) $32x^8 \div 8x^{32}$, [2]

(b) $\left(\frac{x^3}{64}\right)^{\frac{2}{3}}$. [2]

Question 24

Simplify the following.

(a) $(3x^3)^3$ [2]

(b) $(125x^6)^{\frac{2}{3}}$ [2]

Question 25

Find the value of n in the following equations.

(a) $2^{n} = 1024$ [1]

(b) $4^{2n-3} = 16$ [2]

Question 26

Simplify

(a) $\left(\frac{16}{81}x^{16}\right)^{\frac{1}{2}}$, [2]

(b) $\frac{16y^{10}\times 4y^{-4}}{32y^{7}}$. [2]

Question 27

Simplify

(a) $\left(\frac{p^4}{16}\right)^{0.75}$, [2]

(b) $3^2 q^{-3} \div 2^3 q^{-2}$. [2]

Question 28

Write $2^{8} \times 8^{2} \times 4^{-2}$ in the form 2^{n}. [2]

Question 29

Simplify $(27x^{3})^{\frac{2}{3}}$. [2]

Question 30

(a) Simplify $(27x^6)^{\frac{1}{3}}$. [2]

(b) $(512)^{-\frac{2}{3}} = 2^p$. Find p. [2]

Question 31

(a) $\sqrt{32} = 2^p$. Find the value of p.

[2]

(b) $\sqrt[3]{\frac{1}{8}} = 2^q$. Find the value of q.

[2]

Question 32

Simplify $\frac{2}{3}p^{12} \times \frac{3}{4}p^{8}$.

[2]

Question 33

Simplify.

(a) $81^{\frac{3}{4}}$ [1]

(b) $x^{\frac{2}{3}} \div x^{-\frac{4}{3}}$ [1]

(c) $\left(\frac{8}{y^6}\right)^{-\frac{1}{3}}$ [2]

Question 34

(a) $2^r = \frac{1}{16}$

Find the value of r. [1]

(b) $3^t = \sqrt[5]{3}$

Find the value of t. [1]

Question 35

Work out.

(a) $125^{\frac{2}{3}}$ [1]

(b) $\left(\frac{1}{3}\right)^{-2}$ [1]

Question 36

(a) Simplify.

$$(16x^{16})^{\frac{3}{4}}$$

[2]

(b) $2p^{\frac{3}{2}} = 54$

Find the value of p.

[2]

Question 37

Simplify.

$$\left(\frac{8}{a^{12}}\right)^{\frac{1}{3}}$$

[2]

Question 38

Work out.

(a) $t^{24} \div t^4$ [1]

(b) $(x^5)^2$ [1]

(c) $(81m^8)^{\frac{3}{4}}$ [2]

Question 39

Simplify. $(36x^{16})^{\frac{1}{2}}$ [2]

Question 40

Simplify.

$$\left(\frac{1}{2}x^{\frac{2}{3}}\right)^3$$

[2]

Question 41

Simplify.

$$(32x^{10})^{\frac{3}{5}}$$

[2]

Question 42

Work out.

$2^{-4} \times 2^{5}$ [1]

Question 43

Simplify.

(a) $(m^{5})^{2}$ [1]

(b) $4x^{3}y \times 5x^{2}y$ [2]

Question 44

Simplify.

$(x^2)^5$ [1]

Question 45

Simplify.

(a) $6w^0$ [1]

(b) $5x^3 - 3x^3$ [1]

(c) $3y^6 \times 5y^{-2}$ [2]

Question 46

(a) Write 5^{-3} as a fraction. [1]

(b) Write 0.004 56 in standard form. [1]

Question 47

Simplify.

$36y^5 \div 4y^2$ [2]

Question 48

Simplify $(16p^{16})^{\frac{1}{4}}$. [2]

Question 49

Simplify.

(a) $x^3y^4 \times x^5y^3$ [2]

(b) $(3p^2m^5)^3$ [2]

Question 50

Simplify.

$$\left(\frac{x^{64}}{16y^{16}}\right)^{\frac{1}{4}}$$

[3]

Question 51

Simplify. [2]

$$6uw^{-3} \times 4uw^{6}$$

Question 52

$81^x = 3$

Find the value of x. [1]

Question 53

Simplify.

(a) $12x^{12} \div 3x^3$ [2]

(b) $(256y^{256})^{\frac{1}{8}}$ [2]

Question 54

(a) Simplify

(i) x^0, [1]

(ii) $m^4 \times m^3$, [1]

(iii) $(8p^6)^{\frac{1}{3}}$. [2]

(b) $243^x = 3^2$

Find the value of x. [2]