TIMGANMATH

INDICES

QUESTION 1

Simplify each of the following

(i) $a^7 \times a^3 \div \left(a^3\right)^2$

(ii) $\left(2b\right)^5 \div 8b^2$

(iii) $\left(\dfrac{3x^2}{x^3}\right)^3 \div \dfrac{27x^7}{x^{21}}$

(iv) $\left(c^2 d\right)^4 \times \left(c^4 d^3\right)^5$

(v) $5\left(ef\right)^3 \times 10ef^2$

(vi) $16m^8 n^7 \div \left(-2m^3 n^2\right)^2$

(vii) $\left(\dfrac{p^2}{q}\right)^6 \times \left(\dfrac{2q^2}{-3p^5}\right)^3$

QUESTION 2

Simplify each of the following, giving your answers in positive index notation.

(i) $18a^{-6} \div 3\left(a^{-2}\right)^2$

(ii) $5b^0 \times 3\left(b^{-2}\right)^2$

(iii) $\left(3c^2 d^{-2}\right)^2$

(iv) $\left(\dfrac{e^2 f^{-1}}{2}\right)^{-3}$

QUESTION 3

Evaluate each of the following without the use of a calculator.

(i) $\sqrt[4]{16}$

(ii) $\sqrt[3]{\dfrac{27}{125}}$

QUESTION 4

Rewrite each of the following in radical form and hence evaluate the results without using a calculator.

(i) $81^{\frac{1}{4}}$

(ii) $8^{-\frac{1}{3}}$

QUESTION 5

Solve each of the equation.

(i) $2^x = 8$

(ii) $5^y = \dfrac{1}{25}$

(iii) $9^z = 27$

QUESTION 6

Use an appropriate substitution, or otherwise, solve $7^{2x+1} + 20(7^x) = 3$.

QUESTION 7

Solve the simultaneous equations,

$$4^x(2^y) = \frac{2^{11}}{16^y}$$

$$5^x(5^{x-6y}) = 1$$