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Time: 45 minutes
Total Marks: 45
Your Score: / 45

Question One: [1, 1, 2, 2, 2, 2, 2 = 12 marks]

Evaluate each of the following:

(a) $\sqrt{49}$

(b) $125^{\frac{1}{3}}$

(c) $64^{\frac{2}{3}}$

(d) 0.2^2

(e) $16^{\frac{-3}{4}}$

(f) $\left(\frac{121}{36}\right)^{\frac{-1}{2}}$

(g) $\sqrt{2\frac{14}{25}}$

Question Two: **[3, 3, 3, 5, 5 =16 marks]**

Simplify each of the following expressions, giving all answers with positive indices.

(a) $\dfrac{\left(4x^2y\right)^2}{20xy^{-5}}$

(b) $\left(3^{-2}mn^4\right)^2 \times 18\left(m^0n^5\right)^{-3}$

(c) $\sqrt{100g^3h^4} \div \left(16g^2h^8\right)^{\frac{1}{4}}$

(d) $\dfrac{\left(2wx^{-3}\right)^3}{9w^{-2}x^4} \times \dfrac{\sqrt[3]{27w^6x^{-3}}}{(4x)^2}$

(e) $\dfrac{50y^{-2}q^3}{\sqrt{25}yq^4} \div \dfrac{10(y^4q^{-8})^2}{\left(125y^{-3}q^6\right)^{\frac{-1}{3}}}$

Question Three: [1, 2, 3, 2, 3, 3, 3 = 17 marks]

Simplify each of the following expressions:

(a) $-2\sqrt{75}$

(b) $3\sqrt{12}\times 4\sqrt{27}$

(c) $5\sqrt{32}-3\sqrt{18}$

(d) $\dfrac{5\sqrt{24}}{15\sqrt{6}}$

(e) $2\sqrt{5}+3\sqrt{4}-6\sqrt{125}+4\sqrt{2}$

(f) $\dfrac{-\sqrt{28}}{8\sqrt{56}}$

(g) $\left(3-2\sqrt{2}\right)^2$

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Time: 45 minutes
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Question One: **[1, 1, 2, 2, 2, 2, 2 = 12 marks]**

Evaluate each of the following:

(a) $\sqrt{49} = 7$ ✓

(b) $125^{\frac{1}{3}} = 5$ ✓

(c) $64^{\frac{2}{3}} = \left(\sqrt[3]{64}\right)^2 = 4^2 = 16$ ✓✓

(d) $0.2^2 = \left(\frac{1}{5}\right)^2 = \frac{1}{25}$ ✓✓

(e) $16^{\frac{-3}{4}} = \frac{1}{\left(\sqrt[4]{16}\right)^3} = \frac{1}{2^3} = \frac{1}{8}$ ✓✓

(f) $\left(\frac{121}{36}\right)^{\frac{-1}{2}} = \left(\frac{36}{121}\right)^{\frac{1}{2}} = \frac{6}{11}$ ✓✓

(g) $\sqrt{2\frac{14}{25}} = \sqrt{\frac{64}{25}} = \frac{\sqrt{64}}{\sqrt{25}} = \frac{8}{5} = 1\frac{3}{5}$ ✓✓

Question Two: **[3, 3, 3, 5, 5 =16 marks]**

Simplify each of the following expressions, giving all answers with positive indices.

(a) $\dfrac{\left(4x^2y\right)^2}{20xy^{-5}}$

$= \dfrac{16x^4y^2}{20xy^{-5}}$

$= \dfrac{4x^3y^7}{5}$

(b) $\left(3^{-2}mn^4\right)^2 \times 18\left(m^0n^5\right)^{-3}$

$= 3^{-4}m^2n^8 \times 18n^{-15}$

$= \dfrac{18m^2}{81n^7}$

$= \dfrac{2m^2}{9n^7}$

(c) $\sqrt{100g^3h^4} \div \left(16g^2h^8\right)^{\frac{1}{4}}$

$= \dfrac{10g^{\frac{3}{2}}h^2}{2g^{\frac{1}{2}}h^2}$

$= 5g$

(d) $\dfrac{\left(2wx^{-3}\right)^3}{9w^{-2}x^4} \times \dfrac{\sqrt[3]{27w^6x^{-3}}}{(4x)^2}$

$= \dfrac{8w^3x^{-9}}{9w^{-2}x^4} \times \dfrac{3w^2x^{-1}}{16x^2}$

$= \dfrac{w^5x^{-10}}{6w^{-2}x^6}$

$= \dfrac{w^7}{6x^{16}}$

(e) $\dfrac{50y^{-2}q^3}{\sqrt{25}yq^4} \div \dfrac{10(y^4q^{-8})^2}{\left(125y^{-3}q^6\right)^{\frac{-1}{3}}}$

$= \dfrac{50y^{-2}q^3}{5yq^4} \times \dfrac{yq^{-2}}{10y^8q^{-16} \times 5}$

$= \dfrac{y^{-1}q^1}{5y^9q^{-12}}$

$= \dfrac{q^{13}}{5y^{10}}$

Question Three: **[1, 2, 3, 2, 3, 3, 3 = 17 marks]**

Simplify each of the following expressions:

(a) $-2\sqrt{75} = -10\sqrt{3}$ ✓

(b) $3\sqrt{12} \times 4\sqrt{27} = 6\sqrt{3} \times 12\sqrt{3} = 72 \times 3 = 216$ ✓ ✓

(c) $5\sqrt{32} - 3\sqrt{18} = 20\sqrt{2} - 9\sqrt{2} = 11\sqrt{2}$ ✓ ✓ ✓

(d) $\dfrac{5\sqrt{24}}{15\sqrt{6}} = \dfrac{\sqrt{4}}{3} = \dfrac{2}{3}$ ✓ ✓

(e) $2\sqrt{5} + 3\sqrt{4} - 6\sqrt{125} + 4\sqrt{2} = 2\sqrt{5} + 6 - 30\sqrt{5} + 4\sqrt{2} = 6 - 28\sqrt{5} + 4\sqrt{2}$ ✓ ✓ ✓

(f) $\dfrac{-\sqrt{28}}{8\sqrt{56}} = \dfrac{-2\sqrt{7}}{16\sqrt{14}} = \dfrac{-1}{8\sqrt{2}}$ ✓ ✓ ✓

(g) $\left(3 - 2\sqrt{2}\right)^2 = \left(3 - 2\sqrt{2}\right)\left(3 - 2\sqrt{2}\right) = 9 - 4\sqrt{2} + 8 = 17 - 4\sqrt{2}$ ✓ ✓ ✓