

REVISION TEST 2 (Page 46)

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This assignment covers the material contained in chapters 3 to 5.

1. Convert 0.048 to a proper fraction.

	<u>Marks</u>
$0.048 = \frac{48}{1000} = \frac{12}{250} = \frac{6}{125}$	2
Total:	2

2. Convert 6.4375 to a mixed number.

	<u>Marks</u>
$0.4375 = \frac{4375}{10000} = \frac{175}{400} = \frac{7}{16}$	2
Hence, $6.4375 = 6\frac{7}{16}$	1
Total:	3

3. Express $\frac{9}{32}$ as a decimal fraction.

	<u>Marks</u>
$\begin{array}{r} 0.28125 \\ 32 \overline{)9.0000} \end{array}$	
i.e. $\frac{9}{32} = 0.28125$	2
Total:	2

4. Express 0.0784 correct to 2 decimal places.

	<u>Marks</u>

$0.0784 = \mathbf{0.08}$, correct to 2 decimal places.	2
Total:	2

5. Express 0.0572953 correct to 4 significant figures.

$0.0572953 = \mathbf{0.05730}$, correct to 4 significant figures.	<u>Marks</u>
	2
Total:	2

6. Evaluate: (a) $46.7 + 2.085 + 6.4 + 0.07$ (b) $68.51 - 136.34$

(a) $46.7 + 2.085 + 6.4 + 0.07 = \mathbf{55.255}$	<u>Marks</u>
(b) $68.51 - 136.34 = - \mathbf{67.83}$	2
Total:	4

7. Determine 2.37×1.2

$\begin{array}{r} 237 \\ \times 12 \\ \hline 2844 \end{array}$ Hence, $2.37 \times 1.2 = \mathbf{2.844}$	<u>Marks</u>
	2
	1
Total:	3

8. Evaluate $250.46 \div 1.1$, correct to 1 decimal place.

$\begin{array}{r} 227.69 \\ 11 \overline{)2504.60} \end{array}$	<u>Marks</u>
	2

Hence, $250.46 \div 1.1 = 227.7$, correct to 1 decimal place.	1
Total:	3

9. Evaluate $5.\dot{2} \times 12$

$5.\dot{2} \times 12 = 5.22222222 \times 12 = 62.666666 = 62.\dot{6}$	<u>Marks</u>
	2
Total:	2

10. Evaluate the following, correct to 4 significant figures: $3.3^2 - 2.7^3 + 1.8^4$

$3.3^2 - 2.7^3 + 1.8^4 = 1.7046 = 1.705$, correct to 4 significant figures.	<u>Marks</u>
	3
Total:	3

11. Evaluate $\sqrt{6.72} - \sqrt[3]{2.54}$ correct to 3 decimal places.

$\sqrt{6.72} - \sqrt[3]{2.54} = 1.2278872\dots = 1.228$, correct to 3 decimal places.	<u>Marks</u>
	3
Total:	3

12. Evaluate $\frac{1}{0.0071} - \frac{1}{0.065}$ correct to 4 significant figures.

$\frac{1}{0.0071} - \frac{1}{0.065} = 125.4604\dots = 125.5$, correct to 4 significant figures.	<u>Marks</u>
	2
Total:	2

13. The potential difference, V volts, available at battery terminals is given by: $V = E - Ir$.

Evaluate V when $E = 7.23$, $I = 1.37$ and $r = 3.60$

	<u>Marks</u>
$V = E - Ir = 7.23 - 1.37 \times 3.60$ $= 7.23 - 4.932 = \mathbf{2.298}$	3
Total:	3

14. Evaluate $\frac{4}{9} + \frac{1}{5} - \frac{3}{8}$ as a decimal, correct to 3 significant figures.

	<u>Marks</u>
$\frac{4}{9} + \frac{1}{5} - \frac{3}{8} = \frac{97}{360} = 0.26944444... = \mathbf{0.269}$, correct to 3 significant figures.	3
Total:	3

15. Evaluate $\frac{16 \times 10^{-6} \times 5 \times 10^9}{2 \times 10^7}$ in engineering form.

	<u>Marks</u>
$\frac{16 \times 10^{-6} \times 5 \times 10^9}{2 \times 10^7} = \mathbf{4 \times 10^{-3}}$	2
Total:	2

16. Evaluate resistance R, given $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ when $R_1 = 3.6 \text{ k}\Omega$, $R_2 = 7.2 \text{ k}\Omega$ and $R_3 = 13.6 \text{ k}\Omega$

	<u>Marks</u>
$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{3.6} + \frac{1}{7.2} + \frac{1}{13.6} = 0.490196078...$	2
from which, $\mathbf{R = \frac{1}{0.490196078} = 2.04 \text{ k}\Omega}$	1

Total:	3
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17. Evaluate $6\frac{2}{7} - 4\frac{5}{9}$ as a mixed number and as a decimal, correct to 3 decimal places.

$6\frac{2}{7} - 4\frac{5}{9} = \frac{44}{7} - \frac{41}{9} = \frac{396 - 287}{63} = \frac{109}{63} = 1\frac{46}{63}$ Total:	Marks 2 1 3
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= 1.730, correct to 3 decimal places.

18. Evaluate, correct to 3 decimal places: $\sqrt{\left[\frac{2e^{1.7} \times 3.67^3}{4.61 \times \sqrt{3\pi}}\right]}$

$\sqrt{\left[\frac{2e^{1.7} \times 3.67^3}{4.61 \times \sqrt{3\pi}}\right]} = 6.184, \text{ correct to 3 decimal places.}$ Total:	Marks 3 3
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19. If $a = 0.270$, $b = 15.85$, $c = 0.038$, $d = 28.7$ and $e = 0.680$, evaluate v correct to 3 significant figures, given that:

$$v = \sqrt{\left(\frac{ab}{c} - \frac{d}{e}\right)}$$

$v = \sqrt{\left(\frac{ab}{c} - \frac{d}{e}\right)} = \sqrt{\left(\frac{0.270 \times 15.85}{0.038} - \frac{28.7}{0.680}\right)} = 8.39, \text{ correct to 3 significant figures.}$ Total:	Marks 4 4
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20. Evaluate the following, each correct to 2 decimal places:

(a) $\left(\frac{36.2^2 \times 0.561}{27.8 \times 12.83}\right)^3$ (b) $\sqrt{\left(\frac{14.69^2}{\sqrt{17.42} \times 37.98}\right)}$

	<u>Marks</u>
(a) $\left(\frac{36.2^2 \times 0.561}{27.8 \times 12.83}\right)^3 = \mathbf{8.76}$, correct to 2 decimal places.	2
(b) $\sqrt{\left(\frac{14.69^2}{\sqrt{17.42 \times 37.98}}\right)} = \mathbf{1.17}$, correct to 2 decimal places.	2
Total:	4

21. If 1.6 km = 1 mile, determine the speed of 45 miles/hour in kilometres per hour.

	<u>Marks</u>
Speed = 45 miles/hour = 45×1.6 km/h = 72 km/h	2
Total:	2

22. The area A of a circle is given by $A = \pi r^2$. Find the area of a circle of radius $r = 3.73$ cm, correct to 2 decimal places.

	<u>Marks</u>
Area , $A = \pi r^2 = \pi \times 3.73^2 = \mathbf{43.71}$, correct to 2 decimal places	3
Total:	3

23. Evaluate B, correct to 3 significant figures, when $W = 7.20$, $v = 10.0$ and $g = 9.81$, given that

$$B = \frac{Wv^2}{2g}$$

$B = \frac{Wv^2}{2g} = \frac{7.20 \times 10.0^2}{2 \times 9.81} = \mathbf{36.7}, \text{ correct to 3 significant figures.}$	<u>Marks</u>
	3
Total:	3

24. Express 56.25% as a fraction in its simplest form.

$56.25\% = \frac{56.25}{100} = \frac{5625}{10000} = \frac{225}{400} = \frac{\mathbf{9}}{\mathbf{16}}$	<u>Marks</u>
	3
Total:	3

25. 12.5% of a length of wood is 90 cm. What is the full length?

If 12.5% of a length of wood is 90 cm, then $1\% = \frac{90}{12.5}$ and full length, i.e. $100\% = \frac{90}{12.5} \times 100 = \mathbf{720 \text{ cm}}$ or 7.20 m	<u>Marks</u>
	1
	2
Total:	3

26. A metal rod, 1.50 m long, is heated and its length expands by 45 mm. Calculate the percentage increase in length.

Percentage increase in length = $\frac{45}{1.50 \times 10^3} \times 100\% = \mathbf{3\%}$	<u>Marks</u>
	2
Total:	2

27. A man buys a house and makes a 20% profit when he sells it three years later for £312,000. What did he pay originally for the business?



	<u>Marks</u>
Original cost = $\frac{\text{new value}}{100 + \% \text{change}} \times 100\% = \frac{312,000}{100 + 20} \times 100\% = \text{£}260,000$	3
Total:	3

TOTAL MARKS FOR REVISION TEST 2: 75
