

1. Without using a calculator, show clearly that  $64^{\frac{2}{3}}$  is equal to 16.

[2]



2. Evaluate.

(i)  $3^0 + 4^{-1}$

(i)----- [2]

$16^{\frac{3}{4}}$

(ii)----- [2]



3. Work out.

$$100^{-\frac{1}{2}}$$

----- [3]



4.

Work out.

$$16^{-\frac{3}{4}}$$

----- [3]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Part marks and guidance	
1			$(64^{\frac{1}{3}})^2$ $= 4^2 = 16$	2	<b>B1</b> for $(64^{\frac{1}{3}})^2$ , $4^2$ or $\sqrt[3]{4096}$ oe	Condone $(64^2)^{\frac{1}{3}}$ and $(4096)^{\frac{1}{3}}$ for B1
			Total	2		
2		i	$1\frac{1}{4}$ oe	2	<b>M1</b> for $[3^0]=1$ or $[4^{-1}]=\frac{1}{4}$ oe	<b>Examiner's Comments</b>  More able candidates correctly identified each term and added them, others were able to identify one term, usually the $3^0$ . Less able candidates thought the negative power gave -4 and some added the 3 and 4 to get 7 and then raised that to the sum of the powers (i.e. $^{-1}$ ).
		ii	8	2	<b>M1</b> for $[16^{\frac{1}{4}}]=\sqrt[4]{16}$ or better	<b>Examiner's Comments</b>  Only the more able candidates were able to give the correct answer. A common wrong method $\frac{3}{4}$ was $\frac{3}{4}$ of 16. Those starting from $16^3$ were unable to get any further.
			Total	4		

Question		Answer/Indicative content	Marks	Part marks and guidance	
3		$\frac{1}{10}$	3	$\frac{1}{\sqrt{100}} \text{ or } \sqrt{\frac{1}{100}}$ <p>B2 for <math>\frac{1}{\sqrt{100}}</math> or <math>\sqrt{\frac{1}{100}}</math></p> $\frac{1}{100^{\frac{1}{2}}}$ <p>Or B1 for <math>100^{\frac{1}{2}}</math> or 10 final answer or</p> $\sqrt{100}$ <p><b>Examiner's Comments</b></p> <p>Many candidates did not understand the relevance of the fraction or negative index with common answers of 50 or -50. A few realised that the negative index meant reciprocal but applied it to <math>100^2</math>.</p>	
		Total	3		

Question		Answer/Indicative content	Marks	Part marks and guidance	
4		$\frac{1}{8}$ oe final answer	3	<p>M1 for fourth root soi M1 for cube soi</p> <p>M1 for reciprocal soi</p>	<p>Each step must be correctly evaluated but FT previous step Allow method marks in any order</p> <p>2 implies M1, <math>\frac{1}{2}</math> implies M1M0M1 8 implies M1M1M0, 4096 implies M0M1M0</p>
				<p><b>Examiner's Comments</b></p> <p>In part (b), candidates' knowledge of indices was also weak. A few interpreted the negative index but most thought that</p> <p><math>16^{\frac{3}{4}}</math> was the same as <math>\frac{3}{4}</math> of 16 and</p> <p>showed 12 as part of the working.</p>	
		Total	3		