

## Grade 8 Technology Worksheet

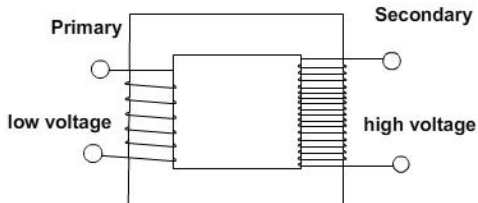
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### Transformer calculations

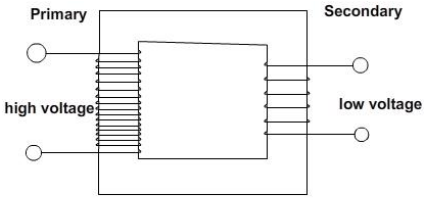
- 1.1.1 Calculate the secondary voltage: [5 marks]  
Primary voltage: 200V  
Primary turns: 400  
Secondary turns: 2000
- 1.1.2 What type of transformer is this? [1 mark]
- 1.1.3 Draw the transformer. [4 marks]
- 1.2.1 Calculate the secondary windings: [5 marks]  
Primary voltage: 120 000V  
Primary windings: 1400  
Secondary voltage: 20 000
- 1.2.2 What type of transformer is this? [1 mark]
- 1.2.3 Draw the transformer. [4 marks]
- [20 marks]

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### Suggested Solutions

Question number	Possible marks	Answers
1	5 marks 1 mark 4 marks 5 marks 1 mark 4 marks	<p>1.1.1 <math>V_s = \frac{N_s}{N_p} V_p</math></p> <p><math>\frac{X}{200V} = \frac{2000t}{400t}</math></p> <p><math>X = \frac{2000t \times 200V}{400t}</math></p> <p><math>X = 1000V</math></p> <p>1.1.2 step up 1.1.3</p> <div style="text-align: center;">  <p><b>STEP UP transformer</b> Output voltage <b>GREATER</b> THAN input voltage</p> </div> <p>1.2.1</p> <p><math>\frac{V_s}{V_p} = \frac{N_s}{N_p}</math></p> <p><math>\frac{20\ 000V}{120\ 000V} = \frac{X}{1400}</math></p> <p><math>\frac{2}{12} = \frac{X}{1400}</math></p> <p><math>0.16 = \frac{X}{1400}</math></p> <p><math>0.16 \times 1400 = X</math></p> <p><math>\frac{20\ 000V \times 1400}{120\ 000V} = X</math></p>

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		<p>X= 224 t</p> <p>1.2.2 step down 1.2.3</p>  <p><b>STEP DOWN transformer</b> Output voltage LESS THAN input voltage</p>
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[20 marks]