

**GCSE Physics A (Gateway)**

**J249/02 Physics A P5-P8 and P9 (Foundation Tier)**

**Question Set 3**

1

Look at the information about different electric motors.

Electric motor	Energy input per hour (J)	Useful energy output per hour (J)	Energy 'wasted' per hour (J)
A	72 000	60 000	
B	54 000	36 000	
C	18 000		3 000
D		48 000	12 000
E	54 000	48 000	

- (a) (i) Calculate the energy input per hour in J for electric motor **D**. [2]
- (ii) Which electric motor has the **lowest** 'wasted' energy in one hour? [1]
- (iii) Which electric motor has the **highest** 'wasted' energy in one hour? [1]
- (iv) Describe how energy is 'wasted' in an electric motor. [1]
- (v) Suggest how this 'wasted' energy can be reduced in an electric motor. [1]
- (b) Calculate the % efficiency of electric motor **E**. [1]
- Use the equation: Efficiency = Useful output energy transfer / Input energy transfer
- Give your answer to **2** significant figures. [3]

**Total Marks for Question Set 3: 9**

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