

# Energy resources/electrical circuits

7I & 7J

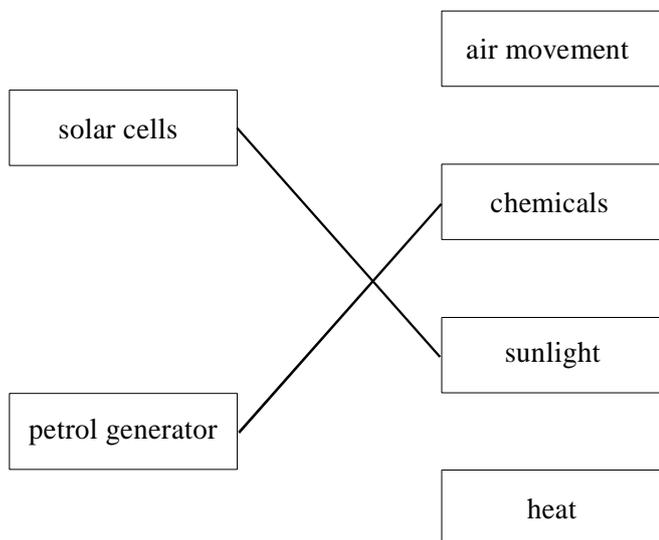
31 min

33 marks

Q1-L3, Q2-L4, Q3-L4, Q4-L5, Q5-L5, Q6-L6

1. (a)

2



*if more than one line is drawn from either method, award no mark for that method*

(b) (i) no light

1

*accept 'no rays from the Sun'*

*do **not** accept 'no heat from the Sun'*

*accept 'no sunshine'*

*accept 'not enough light'*

*accept 'it is dark'*

*accept 'they cannot collect the Sun's energy at night'*

*accept 'because they need light to work'*

*accept 'no Sun'*

- (ii) it might not be windy *accept 'no wind'* 1  
 the wind might not be strong enough  
*accept 'needs air movement' or 'wind'*  
*accept 'sometimes the wind is weak'*  
*accept 'sometimes the wind is stronger'*

[4]

2. (a) ethanol **or** alcohol *if more than one box is ticked,* 1  
*award no mark*
- (b) any **one** from 1  
 • burning hydrogen does not produce carbon monoxide  
*accept 'petrol or ethanol or alcohol produces carbon monoxide'*  
 • burning hydrogen does not produce sulphur dioxide  
*accept 'petrol produces sulphur dioxide'*  
 • burning hydrogen only produces water  
 • burning petrol causes acid rain *accept 'hydrogen or ethanol or alcohol does not cause acid rain'*
- (c) hydrogen *accept 'H<sub>2</sub>'* 1  
*accept 'gas'*
- (d) oxygen ✓ *if more than one box is ticked,* 1  
*award no mark*
- (e) any **one** from 1  
 • it can be grown *accept 'it does not take long to grow'*  
 • it can be replanted *accept 'it can be replaced'*  
 • it is renewable  
 • it can be reproduced *accept 'it produces seeds'*

[5]

3. (a) oil 1  
 natural gas *accept 'gas'* 1  
*answers may be in either order*
- (b) (i) any **two** from *answers may be in either order* 2  
 • wind  
 • solar  
 • tidal  
 • biomass  
 • geothermal
- (ii) C E A B D 2  
*if all three letters are correct, award two marks*  
*if one letter is correct, award one mark*

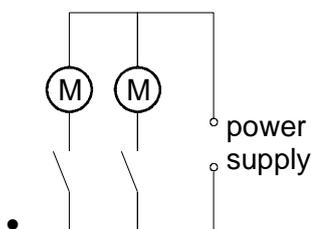
[6]

4. (a) (i) *circuit A: series* 1  
*circuit B: parallel*  
*both answers are required for the mark*

- (b) (i) the circuit **or** heating element will stop working 1  
*accept 'it will not work' or 'it will be off'*  
*accept 'the whole circuit has no current through it'*  
*accept 'it becomes cooler'*  
*do **not** accept 'it breaks the heater or element or it'*
- (ii) any **one** from 1  
  - the circuit **or** element will continue to work
  - one wire will not heat the window*accept 'the bottom one has no current through it'*  
*'nothing' or 'it will not be affected' are insufficient*  
*accept 'it will work less well'*  
*accept 'the bottom wire becomes cooler'*  
*do **not** accept 'it becomes cooler'*  
*do **not** accept 'it does not work properly'*
- (c) (i) thermal accept 'heat' 1  
(ii) *from solid to liquid to gas* 1  
*all three states are required for the mark*  
*accept 'from solid to liquid to vapour or steam'*  
*accept 'from ice to water to vapour or gas'*

[5]

5. (a) pick-up wire 1  
metal wheel  
*answers must be in the correct order*  
*both answers are required for the mark*
- (b) **One mark is for drawing the two motors connected in parallel.**  
**One mark is for drawing one switch in series with each motor.**  
**Both marks should only be awarded if the circuit is correct.**



- (c) any **one** from 1  
  - it completes the circuit
  - it acts as a switch*accept 'because the circuit is not complete'*  
*'the pedal connects the motor' is insufficient*  
*accept 'the pedal connects the motor to the power supply'*

- (d) any **one** from 1
- he does not complete a circuit  
*accept 'the circuit is not complete'*
  - he does not connect the floor and wire mesh ceiling  
*accept 'he is not touching the ceiling'*  
*accept 'he wears trainers' or 'he has rubber shoes'*
- (e) (i) it stops 1
- (ii) it is not affected **or** it keeps going 1
- accept 'it goes slightly faster'*

[7]

6. (a) **The first marking point is for the transfer of energy from water to turbine. The second marking point is for the transfer of energy from turbine to generator. The third marking point is for the transfer of energy away from the generator.**

any **two** from 2

- potential energy in the water to kinetic energy in the turbine  
*accept 'P.E. to K.E.'*  
*accept 'transferred from the water to the turbine'*  
*accept 'K.E. in the water to K.E. in the turbine'*  
*accept 'P.E. in the water to K.E. in the water'*
- kinetic energy in the turbine to kinetic energy in the generator  
*accept 'transferred from the turbine to the generator'*
- kinetic energy in the generator to electrical energy in the circuit  
*accept 'KE. to electrical energy'*  
*accept 'from the generator to the circuit'*  
*accept 'transferred from the generator by electricity'*  
*accept 'KE. in the turbine to electrical energy in the circuit'*  
*accept 'potential energy in the water to electrical energy in the circuit' for both marks*  
*accept 'P.E. to electrical energy'*  
*or 'from the water to the circuit' for one mark*

- (b) any **one** from 1
- because the Moon's pull **or** gravity is always there
  - because the tides **or** the water cannot run out **or** be used up  
*accept 'because there are tides every day'*  
*or 'because there is an endless supply'*
- (c) • from wave energy **or** from the waves 1
- accept 'Ocean Thermal Energy Conversion'*  
*or 'OTEC'*  
*do not accept 'hydro-electric power'*

(d) it is easier to control or it can be turned on when it is needed

1

*accept 'the tides only give power at certain times' or 'you can build an oil-fired power station anywhere' or 'it is smaller'*

any **one** from

- oil is non-renewable
- it causes pollution

*accept 'oil will run out'*

*accept 'it gives out greenhouse gases'*

*or 'it can cause oil spills'*

**[6]**