Energy Resources – 2019 June

1. 0625/31/M/J/19/No.5

Coal is a non-renewable source of energy.

(a) **(i)** Explain what is meant by the term *non-renewable*.

.....

..... [1]

(ii) There are other non-renewable sources of energy.

Place a tick in the box by each non-renewable source of energy.

- ☐ nuclear
- ☐ oil
- ☐ solar
- ☐ wave
- ☐ wind

[1]

(b) State **two** advantages and **two** disadvantages of using natural gas as an energy source.

advantages

1. .....

.....

2. .....

.....

disadvantages

1. .....

.....

2. .....

.....

[4]

[Total: 6]

2. 0625/32/M/J/19/No.5

(a) A nuclear power station generates electrical energy.

The main stages in the operation of the nuclear power station are listed. They are **not** in the correct order.

E Electrical energy is produced.

F The fission of uranium nuclei releases thermal energy.

G A turbine drives a generator.

H Thermal energy heats water to produce steam.

Complete the flow chart to describe how a nuclear power station works.

In each empty box, insert the letter for the correct statement.

The nuclear power station uses uranium as a fuel.

↓

☐

↓

☐

↓

The steam drives a turbine.

☐

↓

☐

↓

Electrical energy is transmitted.

[2]

(b) Electrical energy from the power station is used to power two different lamps. Fig. 5.1 shows how the light outputs from two types of lamp vary with the power input.

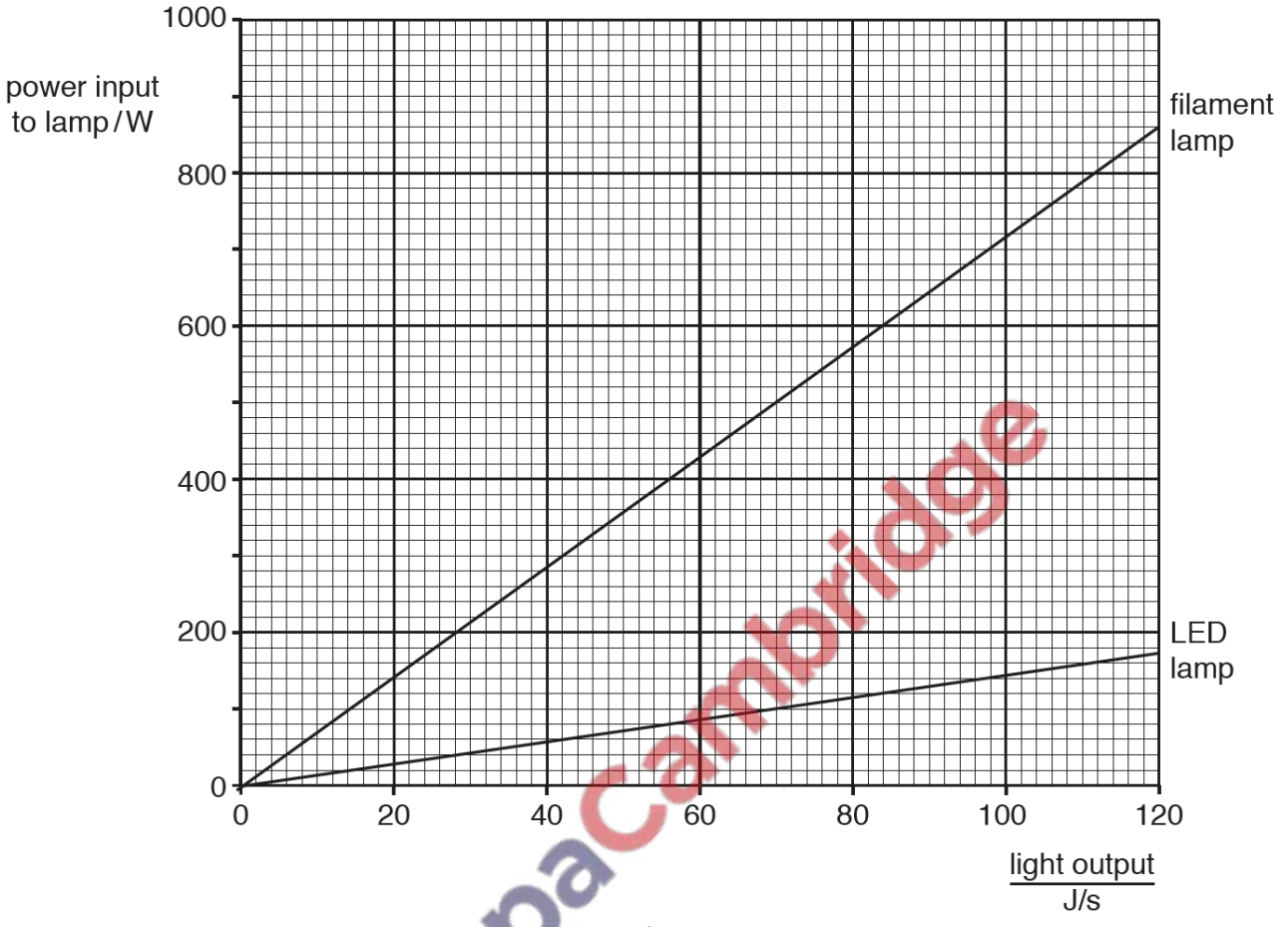

Fig. 5.1

(i) An experiment requires a lamp with a light output of 70 J/s.

For the LED lamp and for the filament lamp determine the input power required to give a light output of 70 J/s. Use information from Fig. 5.1.

1. For the LED lamp, input power = ... W

2. For the filament lamp, input power = ... W

[2]

(ii) Explain why using LED lamps is better for the environment. Use information from Fig. 5.1 in your answer.

.....

.....

.....

..... [2]

[Total: 6]

3. 0625/32/F/M/19/No.5

Fig. 5.1 shows part of a solar farm. The solar panels tilt and rotate.

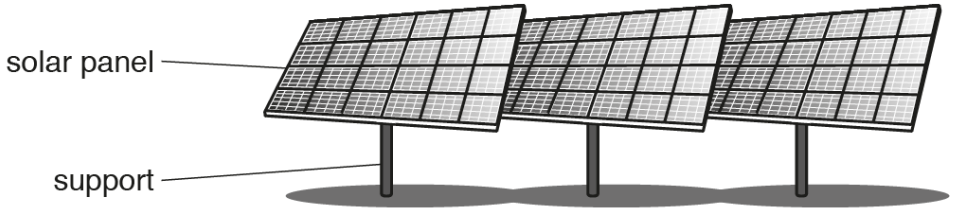

Fig. 5.1

(a) The solar farm converts energy from a source into a different, useful form of energy.

State the energy source and the useful form of energy.

source .....

useful form of energy .....

[2]

(b) Solar farms have advantages and disadvantages.

(i) State **two** advantages of a solar farm.

1. .....

2. .....

[2]

(ii) State **one** disadvantage of a solar farm.

..... [1]

(c) Suggest why it is useful that the panels can tilt and rotate.

.....

..... [1]

[Total: 6]

4. 0625/42/F/M/19/No.2

(a) State **one** advantage and one disadvantage of using a wind turbine as a source of electrical energy.

advantage .....

disadvantage .....

[2]

(b) Fig. 2.1 shows a wind turbine.

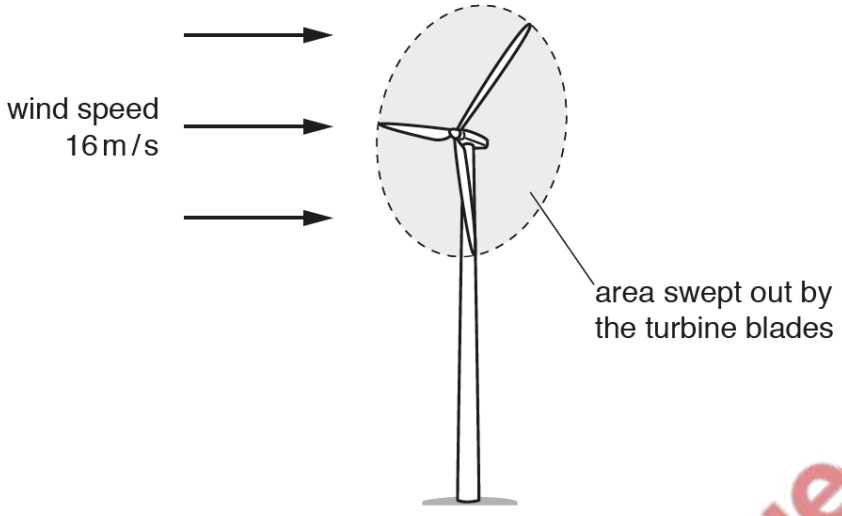

Fig. 2.1

(i) The wind blows at a speed of 16 m/s towards the turbine blades. In one second, a volume of 24 000 m^3 of air passes through the circular area swept out by the blades. The density of air is 1.3 kg/m^3.

Calculate:

1. the mass of air that passes through the circular area swept out by the blades in 1.0 s

mass = ... [2]

2. the kinetic energy of the mass of air that passes through the area swept out by the blades.

kinetic energy = ... [2]

(ii) Suggest why some of the kinetic energy of the air that passes through the circular area swept out by the blades is **not** converted into electrical energy.

.....

..... [1]

[Total: 7]