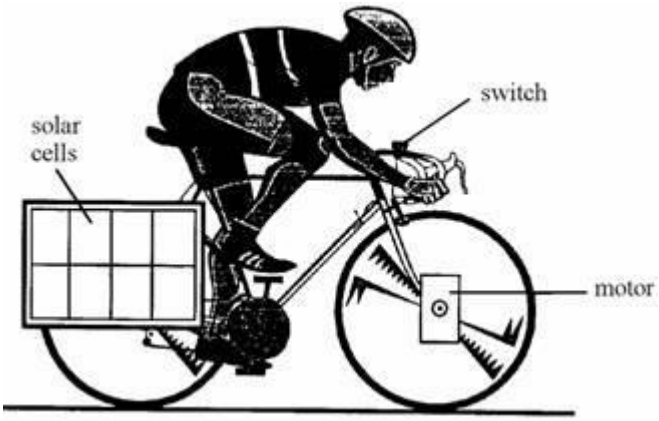
Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

The diagram shows an experimental solar-powered bike.



A battery is connected to the solar cells.
The solar cells charge up the battery.
There is a switch on the handlebars.
When the switch is closed, the battery drives a motor attached to the front wheel.

(a) Use words from the list to complete the following sentences. Words may be used once, more than once, or not at all.

chemical **electrical** **heat (thermal)** **kinetic**

light **potential** **sound**

(i) The solar cells transfer _____ energy to _____ energy.

(ii) When the battery is being charged up, _____ energy is transferred to _____ energy.

(iii) The motor is designed to transfer _____ energy to _____ energy.

(6)

(b) (i) The cyclist stops pedalling for 10 seconds. During this time the motor transfers 1500 joules of energy. Calculate the power of the motor.

_____

_____

Power _____ W

(2)

(ii) Name **one** form of wasted energy which is produced when the motor is running.

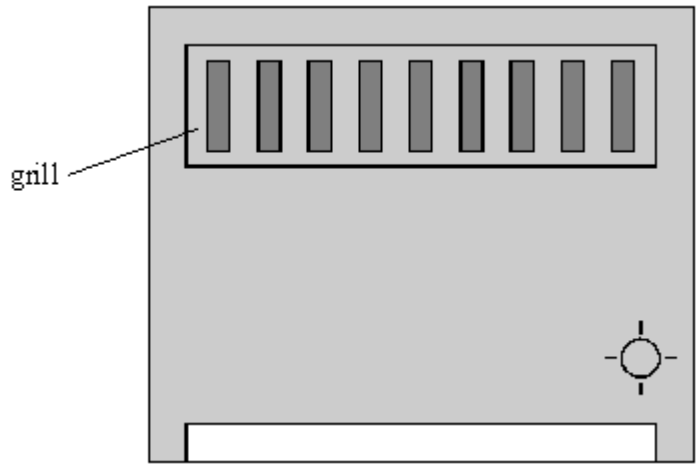
_____

(1)

(Total 9 marks)

Q2.

The diagram shows a fan heater.



(a) Complete this sentence.

The fan heater is designed to transfer electrical energy as _____

energy and _____ energy.

(2)

(b) The fan heater is connected to the mains by a three core cable.

(i) Why are the wires in the cable made out of copper?

_____

(ii) Why are the wires in the cable covered by plastic?

_____

(2)

(c)

You may find this equation useful when answering this part of the question **energy transferred (kWh) = power (kilowatt, kW) × time (hour, h)**

(i) The power of the fan heater is 2.75 kW.
Calculate how many kilowatt hours (kWh) of energy are transferred when the fan heater is used for 6 hours.

_____

_____

Number of kilowatt hours _____

(2)

(ii) How much will it cost to use the fan heater for 6 hours if one Unit of electricity costs 7p?

_____

_____

Cost _____ p

(2)

(d) A fault caused a much higher than normal current to flow in the heater.
Describe what happened to the wire in the fuse.

_____

_____

_____

(2)

(Total 10 marks)