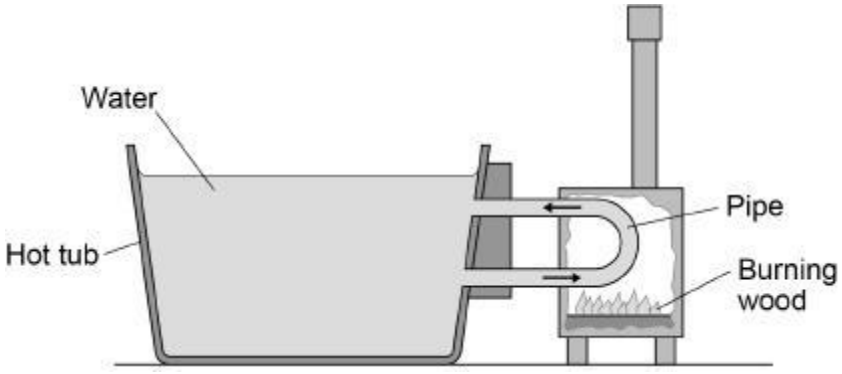
Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Energy (High Demand)

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Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Q1.

The diagram below shows a wood-fired hot tub.



(a) What type of fuel is wood?

Tick (✓) **one** box.

A non-renewable biofuel	☐
A non-renewable fossil fuel	☐
A renewable biofuel	☐
A renewable fossil fuel	☐

(1)

(b) Give **two** environmental effects of using wood as an energy resource.

1. _____

_____

2. _____

_____

(2)

(c) Describe the change to the stores of energy of the wood, pipe and water as the water is heated.

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Wood _____

_____

Pipe _____

_____

Water _____

_____

(3)

(d) The temperature of the water reaches 42 °C

The temperature then stays constant even though the fire continues to burn.

Explain why the temperature of the water stays constant.

_____

_____

_____

_____

_____

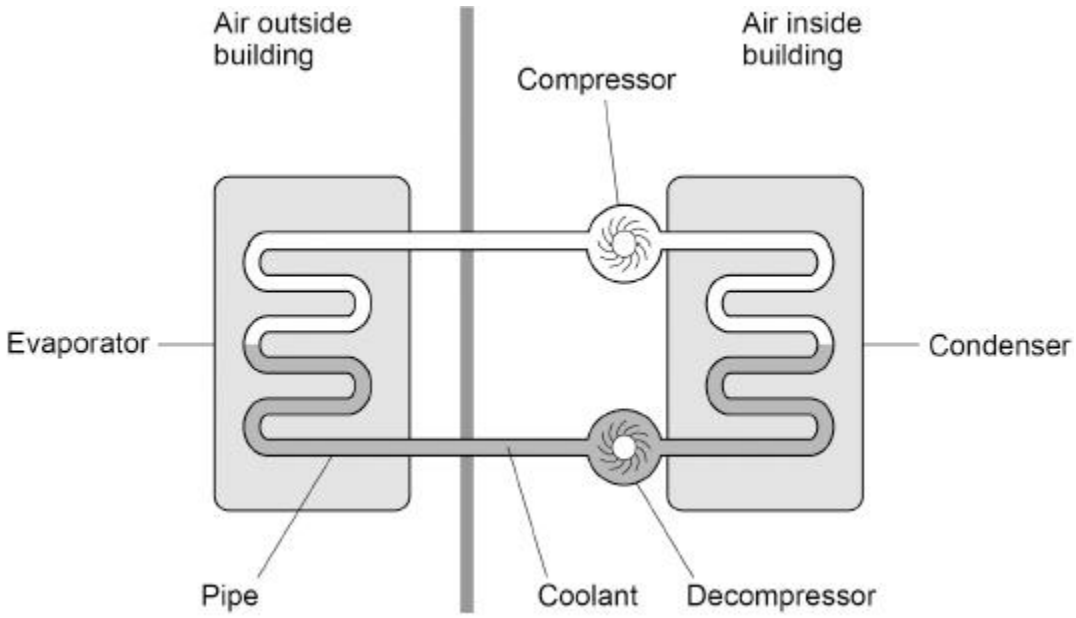
(2)

(Total 8 marks)

Q2.

An air source heat pump transfers energy from the air outside a building to increase the temperature of the air inside the building.

The figure below shows an air source heat pump.



The compressor is connected to the mains electricity supply.

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The pipe in the heat pump contains a substance called coolant.

In the evaporator, energy is transferred from the air outside the building to the liquid coolant.

The temperature of the coolant increases and it evaporates.

(a) Explain what happens to the internal energy of the coolant as its temperature increases.

_____

_____

_____

_____

(2)

(b) What name is given to the energy needed to change the state of the liquid coolant?

_____

(1)

(c) What happens to the mass of the coolant as it evaporates and becomes a vapour?

Tick (✓) **one** box.

Decreases	☐
Stays the same	☐
Increases	☐

(1)

(d) The compressor increases the density and temperature of the coolant vapour inside the pipe.

Explain why the pressure in the pipe increases.

_____

_____

_____

_____

(2)

(e) The condenser transfers energy from the coolant to the air in the building.

When the total energy input to the heat pump system is 1560 kJ the temperature of the air in the building increases from 11.6 °C to 22.1 °C.

The efficiency of the heat pump system is 87.5%.

The mass of the air inside the building is 125 kg.

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Calculate the specific heat capacity of the air in the building.

Give your answer in standard form.

Specific heat capacity (standard form) = _____ J/kg °C

(6)

(f) The air in the building gains 400 J for every 100 J of energy transferred from the mains electricity supply to the compressor.

An advertisement claims that the heat pump system has an efficiency of 400%.

Explain why the advertisement is **not** correct.

(3)

(Total 15 marks)

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