

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Q1.

Radio waves, ultra-violet, visible light and X-rays are all types of electromagnetic radiation.

- (a) Choose wavelengths from the list below to complete the table.

$3 \times 10^{-8} \text{ m}$ $1 \times 10^{-11} \text{ m}$ $5 \times 10^{-7} \text{ m}$ 1500 m

TYPE OF RADIATION	WAVELENGTH (m)
Radio waves	
Ultra-violet	
Visible light	
X-rays	

(4)

- (b) Microwaves are another type of electromagnetic radiation.

Calculate the frequency of microwaves of wavelength 3 cm.

(The velocity of electromagnetic waves is $3 \times 10^8 \text{ m/s}$.)

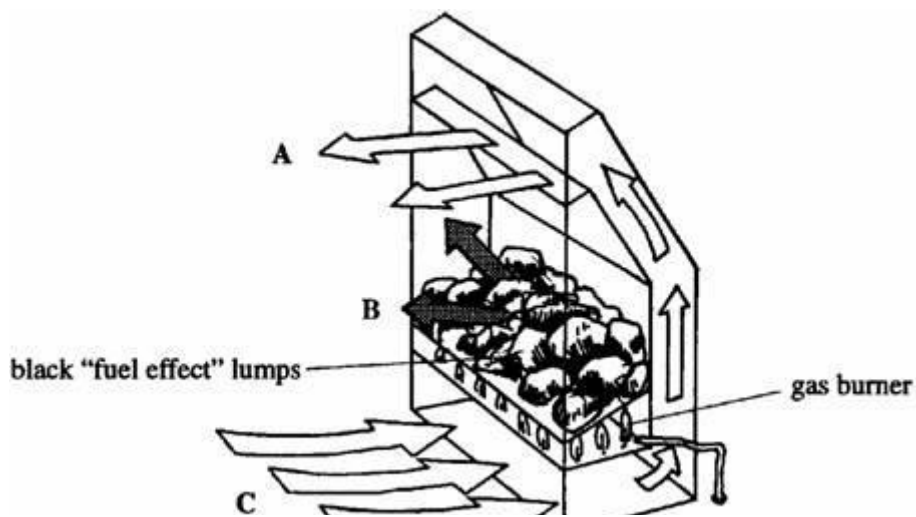
(4)

(Total 8 marks)

Q2.

The diagram comes from a leaflet about a “coal effect” gas fire.

It shows how air circulates through the fire.



- (a) Explain in detail why the air travels from **C** to **A**.

(4)

- (b) The black “fuel effect” lumps become very hot.

- (i) Name the process by which the lumps transfer thermal energy to the room as shown at **B**.

(1)

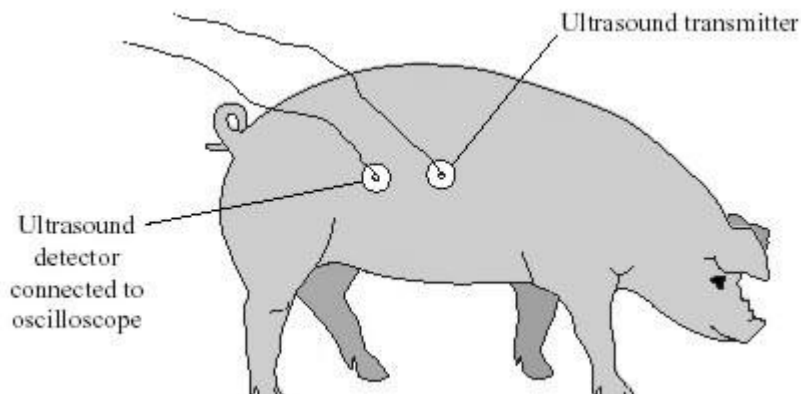
- (ii) Suggest **one** feature of the black “fuel effect” lumps which make them efficient at transferring energy.

(1)

(Total 6 marks)

Q3.

Pigs have a layer of fat in their skin. Underneath the fat is a layer of muscle. Ultrasonic waves are used to measure the thickness of the layer of fat. An ultrasound transmitter and detector are attached to the skin of the pig.



- (a) Explain why ultrasound can be used to measure the thickness of the layer of fat.

(2)

- (b) The oscilloscope does not measure distance directly.

- (i) What does the oscilloscope measure in this case?

(1)

- (ii) What other information is needed to calculate the thickness of the layer of fat in a pig?

(1)

(Total 4 marks)