

Name of the Student: _____

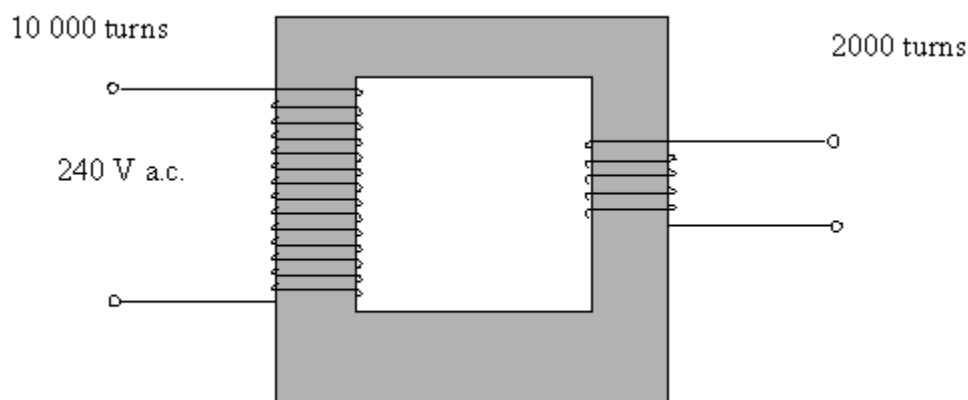
Max. Marks : 13 Marks

Time : 13 Minutes

Q1.

- (a) An appliance in a house has a transformer. The transformer is used to reduce the voltage to the level needed by the appliance.

The diagram shows the transformer.



- (i) Name the material used for the core of the transformer.

(1)

- (ii) The transformer has 10 000 turns on the input side and 2 000 turns on the output side. If the mains voltage of 240 volts is applied to the input, calculate the output voltage. You may find the following information helpful:

$$\frac{\text{output voltage}}{\text{input voltage}} = \frac{\text{number of turns on output coil}}{\text{number of turns on input coil}}$$

(3)

- (b) Explain, in terms of magnetic fields, how a transformer works.

(4)

- (c) A 12 V car battery is connected to the input leads of the transformer. It is hoped to reduce the voltage to 2.4 V in order to run a small motor. When the output voltage is measured it is found to be zero.

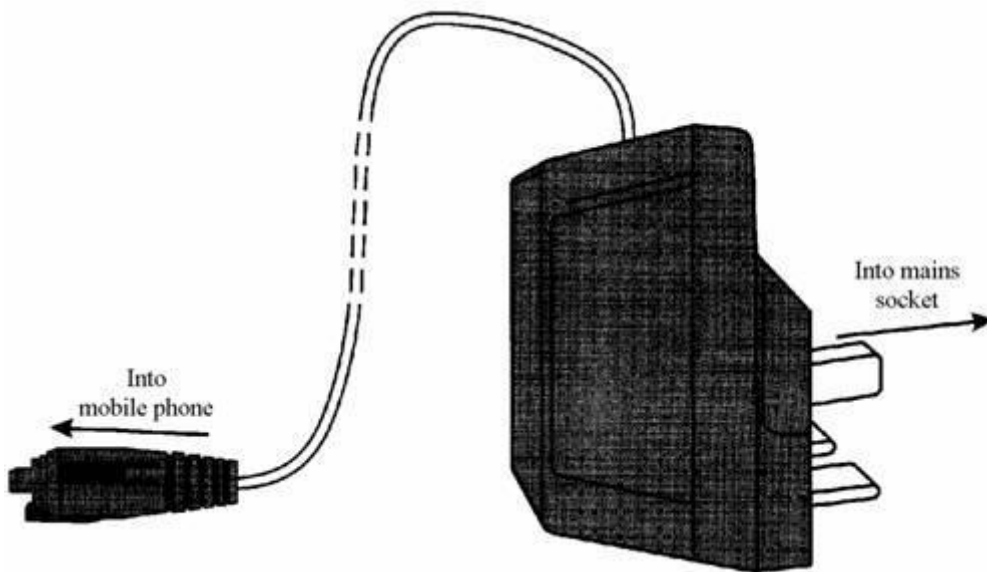
Explain why the output voltage is zero.

(2)

(Total 10 marks)

Q2.

- (a) The drawing shows a small transformer used to recharge the battery in a 4.2 V mobile phone from a 230 V mains supply.



Explain how you know that this is a *step-down* transformer.

(1)

- (b) A transformer consists of an insulated coil of wire, called the primary coil, on one side of a core. Another coil of insulated wire, called the secondary coil, is on the other side.

Give **two** features of the *core*.

1. _____

2. _____

(2)

(Total 3 marks)