

Name of the Student: \_\_\_\_\_

Max. Marks : 17 Marks

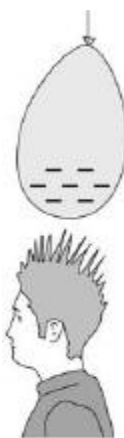
Time : 17 Minutes

**Q1.**

**Figure 1** shows a student after rubbing a balloon on his hair.

The balloon and hair have become charged.

**Figure 1**



(a) Describe the force that acts on the student's hair in **Figure 1**.

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(2)

(b) An earthed conductor was brought near the charged student.  
A spark jumped between the conductor and the student.

The potential difference between the conductor and the student was 2.5 kV  
The energy transferred by the spark was 0.0050 J

Calculate the charge transferred by the spark.

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Charge = \_\_\_\_\_ C

(c) A defibrillator can transfer a charge to regulate a person's heartbeat.

Figure 2 shows a defibrillator.

Figure 2



When the defibrillator is in use, a potential difference of 4800 V is applied across the person's chest.

A charge of 0.16 coulombs passes through the person's chest in 4.0 ms

Calculate the resistance of the person's chest.

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Resistance = \_\_\_\_\_  $\Omega$

(5)  
(Total 10 marks)

**Q2.**

The figure below shows a Bunsen burner heating some water in a beaker. Eventually the water changes into steam.



- (a) Explain how the internal energy of the water changes as it is heated from 20 °C to 25 °C

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(2)

- (b) How is the particle model used to explain the difference in density between a liquid and a gas?

Tick (✓) **one** box.

Particles in a gas have less kinetic energy than particles in a liquid.

Particles in a gas have more potential energy than particles in a liquid.

Particles in a liquid are further apart than particles in a gas.

Particles in a liquid are larger than particles in a gas.

(1)

- (c) A student measured the mass of boiling water that was turned into steam in five minutes.

Explain how the student could use this information to estimate the power output of the Bunsen burner in watts.

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**(4)**  
**(Total 7 marks)**