

--	--	--	--	--

Centre Number

Section II (continued)

--	--	--	--	--	--	--	--	--

Student Number

Marks

Question 13 — Personal and Public Transport (10 marks)

A railway track has rails made of 0.8% carbon steel.

- (a) The surface of the rails has been induction heated and water quenched. Describe the final structure and properties of the rail. **3**

.....

.....

.....

.....

.....

.....

- (b) A suburban train weighing 400 tonnes has to climb a gradient of 1 in 50 at a constant velocity of 60 km per hour. **3**

If the power required to overcome rolling resistance at this velocity is 450 kW, calculate the overall power needed to climb the gradient.

Power =

Question 13 continues on page 16

Question 13 (continued)

- (c) (i) Describe how an electric motor is used to convert electricity into rotary motion. **2**

.....
.....
.....
.....
.....

- (ii) Describe TWO different applications of electrical motors that are used in transport systems. **2**

.....
.....
.....
.....
.....

End of Question 13