

2003 HIGHER SCHOOL CERTIFICATE EXAMINATION  
Engineering Studies

Section II (continued)

Marks

Question 16 — Telecommunication (15 marks)

- (a) (i) The telecommunications industry uses copper and fibre optics for transmission of data. State a different application for each of these materials, and explain, in terms of their properties, why they are used for this application. 4

..... fibre optics are also used for communication. These  
~~optics~~ cables are used to transport signals to  
and from particular points throughout the globe.  
Without the optical cables, communication would have to  
resort to satellite, microwave or mail.

Copper is a good conductor of electricity  
and has ~~a little~~ very small size ~~and~~ good  
has a high resistant value.

- (ii) Cold drawing is used to form copper into electrical wire. Describe TWO problems associated with the use of the process. Describe a subsequent process that will reduce these problems. 3

It compacts the elongated grains into equiaxed grains, this forms a tighter and stronger microstructure. However cold rolling ~~forms the~~ requires large and heavy machines to produce the desired result, which cost large quantities of money, a process that could ~~not~~ reduce this is forging or drawing the material. As heating the material to the austenitic range  $723^{\circ}$  would cause the copper to melt.

Question 16 continues on page 26

Question 16 (continued)

- (b) Identify TWO technological changes in the telecommunications industry. Discuss the effects that these changes have had on society. 4

1. The current evolution of communication satellites. These satellites allow for easier, clearer communication between people, they improve the distances of which the telecommunications are required. Other uses developed through satellites are programs such as Foxtel where they use the satellite technology to broadcast their show, allowing for a crisper, television show.

- (c) (i) Describe the transmission of data from a mobile phone to another mobile phone. 2

As a digital <sup>signal</sup> is sent to the ~~station~~ <sup>repeater</sup> station, the signal is transferred into ~~analog~~ <sup>analogue</sup> an analogue signal. The ~~data~~ data is retrieved by another user through the aerial on the phone in a digital signal.

- (ii) Explain the effect that mobile phone communications may have on other electronic systems. State TWO situations where this effect could endanger lives. 2

1. Talking a driving, loss of concentration  
 2. the waves being emitted from the mobile waves, could be harmful.

End of Question 16