

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

Copper is used as a medium for an electrical current to be transported because it's a conductor & uses electricity only one signal can be sent at any one time although it's thick compared to opticle fibre which relays information transformed into light, through its core, can send hundreds of messages at a time and is much cheaper & easier to manufacture.

- (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

Due to cold drawing the wire is alot denser and can have surface imperfections which can all stop/interfear with the signal that has been sent. An alternative method could be to hot draw it which would leave it with a better structure and less surface imperfections.

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Question 16 (continued)

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

The use of satellites that able you to communicate with people in other countries without wires or cable and allow's mobile phones to be used.

Another change is with micro-waves instead an radiowave's which enable a better and clearer signal, to be sent through space

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

The sound energy is transformed into electrical energy than to micro-wave's. Then recieved by another phone and converted to electrical & then back to sound energy

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

In an aeroplane a mobile phone could disturb navigation & cause a surge in the cock pit. And if the wrong signal is recieved the plane could be miss-lead & crash.

End of Question 16