2001 HIGHER SCHOOL CERTIFICATE EXAMINATION

Senior Science

Section I – Part B (continued)

Marks

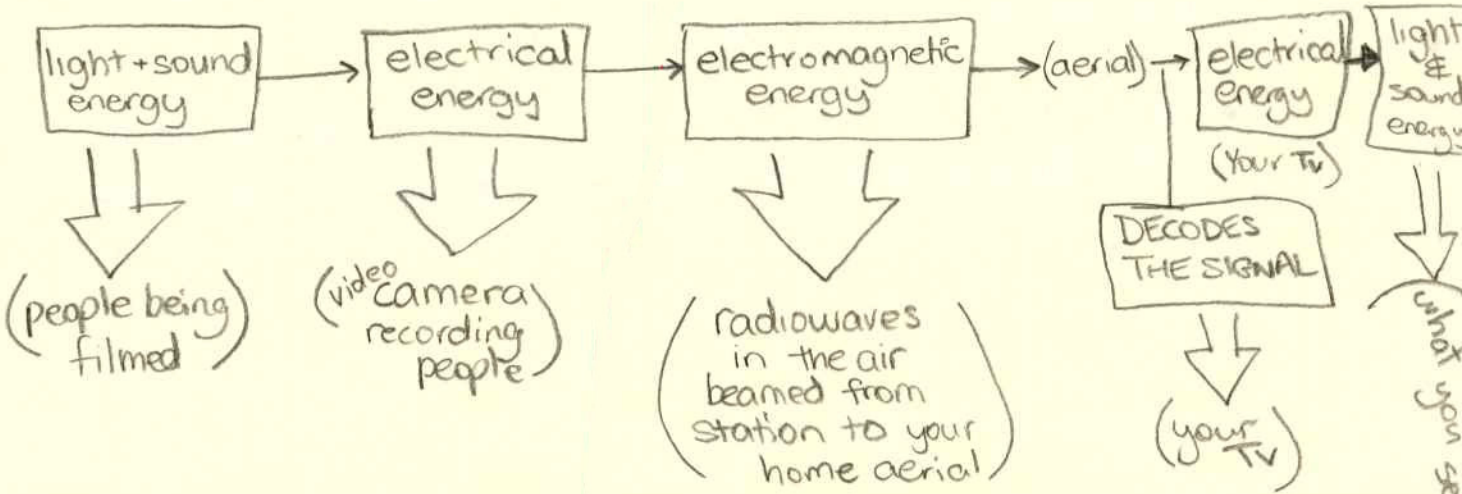
Question 24 (3 marks)

Mobile phones use microwaves. Describe the properties of microwaves that make them useful in mobile phone communication. **3**

- They can be focused & therefore concentrated into stronger beams for long distance communication
- Microwaves travel at the speed of light so communication is fast
- Microwaves are electromagnetic & hence don't need matter (eg cables) to travel through
- Microwaves can be relayed via satellites & towers again meaning long distance communication

Question 25 (7 marks)

(a) When a television signal reaches your house it passes from the aerial, through the television, to your eye. Construct a flowchart to show the sequence of events in the transfer of this message. On your flowchart, indicate the energy transformation occurring at each stage, and label ONE place where decoding occurs. **3**



Question 25 continues on page 22

Marks

Question 25 (continued)

(b) During the 1940s, radio was the main form of electronic mass communication in Australian homes. Now televisions are common. Analyse the impact of this change in mass communication on society. **4**

- We can decipher/understand/be informed about large amounts of information through pictures (moving pictures) and sound. No longer just audio (sound), like radio, but picture as well.
- Advertisement has become a multi-million dollar industry due to the ~~$~~ effectiveness of communicating a message to a large audience.
- Society may have become less sociable, less interaction with other people if one can be entertained, informed (news) and these days even purchase products at home, thanks to television.
- Because television can inform and entertain the viewer more effectively than previous forms of mass communication, the previous forms have suffered. eg. can watch and listen to the news on TV instead of just hearing it on radio. Therefore ~~the~~ other medias such as radio and newspapers etc. have perhaps lost a percent of their potential audience that they would have if TV were not around.

End of Question 25

- ~~Despite being slightly more expensive than radio~~ After the first purchase price of the TV, the running cost of TV is practically the same as the radio — pay for electricity. ∴ why not pay for both audio & pictures?!
- The television industry is a multi-million dollar industry and ~~has~~ provides thousands of Australians with jobs.

Marks

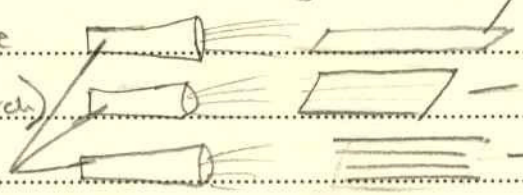
Question 26 (8 marks)

You have carried out an investigation in which you observed the transmission of light through an optic fibre, and compared it with another material such as nylon or glass. Write a scientific report on this investigation. **8**

Your report should include:

- your method, including a diagram;
- an outline of the observations you made;
- an analysis of your results; and
- your conclusions.

Method: 1 Shine a torch through a ruler, optic fibre and glass. (use the same torch)



(carry all three out in a dark room)

2. observe light visible at opposite end

Observations: Light was not easily seen at the end of the ruler. Light fibre was more easily seen at the end of the glass. Light at the end of the optic fibre was very bright.

Note - same torch must be used to provide a control.

Results:

Ruler	Piece of Glass	optic Fibre
Did not transmit light well.	Transmitted light moderately.	Provided excellent transmission of light.

Conclusion - optic fibre provides the best transmission of light when compared to a ruler and a piece of glass.