Question 23 (20 marks) Use a SEPARATE writing booklet.

The way organisations undertake business has changed dramatically, with faster and smarter hardware and software. Network communications technology has been emerging as a result.

An analyst has been employed to develop a new computer system for a country medical practice. The practice has evolved by amalgamation of small medical practices in four country towns in NSW. In the final structure there will be six doctors, all of whom have basic computer skills, and who will generally operate in their own town.

(a)   The following is a BNF syntax definition used by the new network communications system.

```
<identifier>:: = <letter> |_<letter or digit>

<upper_case>:: = A|B|C|...|X|Y|Z

<lower_case>:: = a|b|c|...|x|y|z

<letter>:: = <upper_case> | <lower_case>

<digit>:: = 0|1|2|...|7|8|9

<special_character>:: = "|#|%|$|'|(|)|*|+|−|,|.|/|:|=|<|>|||

<space>:: = ASCII character 32

<letter or digit>:: = <letter> | <digit>

<number>:: = <decimal> | # <hexadecimal>

<integer>:: = <digit> | <digit> <integer>

<endline>:: = ASCII character 13

<comment>:: = // <uppercase> <endline> | <lower_case> <endline> |
              <digit> <endline> | <special_characters> <endline> | <space>
              <endline> | <endline>
```

(i)   Identify and explain ONE problem with the BNF technique shown.   **3**

(ii) In messages being sent, a <hexadecimal> value is required to indicate the beginning and the ending of a message component. Using your understanding of what a hexadecimal number is, write a syntax rule in BNF to define <hexadecimal>.   **3**

Question 23 (continued)

(b) Assess the possible effects of emerging network communications technology on the everyday usage of this system. **5**

(c) The new network communications system will provide the major components of:

- a central store of patient medical records;

- centralised patient billing, and handling of payments from medical funds to doctors; and

- one point of contact for patients via a single receptionist.

As the amalgamation is to occur in three months time, the major components of the system need to be operating at that time.

(i) Outline ways the analyst could involve each different type of user in the process of defining and understanding the problem. **3**

(ii) Evaluate the different software development approaches available for this network communications system. **6**

End of Question 23