Marks

Question 22 (20 marks) Use a SEPARATE writing booklet.

The national railway network has been privatised. In its reorganisation, the new owners decide to automate the operation of the ticket sales and timetable information. They will install a computer system to dispense tickets and timetable information at all stations. Existing staff will be reassigned to assist in the day-to-day running of this system. Touch screens will be installed so that customers will not need to use keyboards to purchase tickets or gain information. Tickets can be paid for by swiping a credit or debit card through a standard magnetic card reader, or by cash. The system will perform the following tasks:

- process the purchase of tickets;
- display train timetable information on the screen;
- display information regarding the early or late arrival of trains currently running; and
- plan journeys.

(a) Discuss the software development approach that would be most suitable for this system. **3**

(b) Currently a feasibility study is being undertaken. **4**

Identify TWO key factors to be considered in determining the technical feasibility of the system. Discuss the importance of each factor you have identified.

(c) The development of the system involves the consideration of a number of interactive components.

(i) Construct a storyboard to describe the purchase of tickets. **4**

(ii) Design a screen that could be used as the main menu for the system. **2**

(d) The system has been implemented and it is found that the information on the touch screens is not accessible to all train travellers. **2**

Identify ONE group of travellers who may have a major problem in using touch screens and explain how this problem could be resolved.

Question 22 continues on page 13

Marks

Question 22 (continued)

(e) Write an algorithm to calculate the cost of the tickets that the train traveller wants to buy. **5**

Part of the algorithm is to conduct a search of an array of records containing the single full fare and return full fare for each destination. The search needs to extract fare information for the destination station selected by the train traveller.

The structure of the array of records is:

destination (index).station	destination (index).fullsingle	destination (index).fullreturn

A portion of the array of records is shown below.

Scone	$23.80	$42.50
Singleton	$15.40	$28.40
Springwood	$ 5.20	$ 9.60

Use the variable names:

UserDest	to stand for the destination station selected by the train traveller;
NumSingle	to stand for the number of one-way tickets the traveller wishes to purchase;
NumReturn	to stand for the number of return tickets the traveller wishes to purchase; and
TotalFare	to stand for the total cost of all tickets purchased.

For this algorithm you may assume that:

- there are 100 records in the array of records;
- no concession, child or student fares are available;
- the variables NumSingle and NumReturn could be zero. (If both variables were zero then TotalFare would be zero.)

End of Question 22