MARKS

**2.** The share prices for the top 100 technology companies are stored in a program. The program uses an array of records called `companies` with fields for `companyName` and `sharePrice`. Sample data stored in the array of records is shown below.

| companyName | sharePrice |
|---|---|
| Apex Industries | 87.23 |
| Blue Horizon Ventures | 56.89 |
| Celestial Technologies | 102.34 |
| … | … |
| Vertex Cybersecurity | 79.56 |
| Zephyr Wind Power | 67.89 |
| Zeta Blockchain Systems | 110.23 |

A binary search algorithm will be used to search for a company's name and display its share price.

(a) State one reason why the data shown is suitable for this algorithm. **1**

(b) State the maximum number of comparisons required to find any company name using this algorithm. **1**

(c) The design of a binary search algorithm shown below contains three errors.

```
1.  set low to 0
2.  set high to 99
3.  set found to false
4.  get target company name
5.  while not found and low ≠ high
6.      set middle to (high − low) /2
7.      if target = company name at middle position then
8.          set found to true
9.      else
10.         if target is before company name at middle position then
11.             set high to middle − 1
12.         else
13.             set high to middle − 1
14.         end if
15.     end if
16. end while
17. if found then
18.     display share price at middle position
19. else
20.     display not found message
21. end if
```

Identify the three lines that contain an error and describe the corrections required. **3**