2008 Paper 10 Question 1

Foundations of Programming

(*a*) Briefly describe *ASCII* and *Unicode* and draw attention to any relationship between them. [3 marks]

(*b*) Briefly explain what a *Reader* is in the context of reading characters from data. [3 marks]

A novice programmer has written the following copying program which is intended simply to read characters from data one at a time and to write them out.

```
public class Copying
 { public static void main(String[] args)
    { int ch;
      while ((ch = System.in.read()) != -1)
      { System.out.printf("%c", (char) ch);
      }
    }
 }
```

(*c*) Unfortunately this program causes a compile-time error. Explain what the problem is and modify the code so that the program compiles. [3 marks]

(*d*) The amended program correctly copies data in simple cases but is found to fail when exotic characters are encountered. Why is this? [3 marks]

(*e*) By exploiting a Reader, rewrite the program so that exotic characters no longer cause any problems. [8 marks]