2009 Paper 5 Question 1

Compiler Construction

(a) Give *two* reasons why a compiler is typically broken down into *passes* (or *phases*) and indicate a typical set of passes and the data structures passed between them.   [4 marks]

(b) Explain one way in which the process of compiling a Java applet, to be stored on a web page and run within many browsers, might differ from that of compiling an application and running it multiple times on a single machine.
                                                                        [2 marks]

(c) Explain the difference between a file containing textual assembly code and a file containing an object module. Indicate the essential structure of an object file, for example ELF, highlighting the purpose of each section. Give assembly-level or C-level code that produces entries in each of these sections.   [7 marks]

(d) Explain the actions of a *linker*, the role of libraries and what makes certain object files directly executable.   [4 marks]

(e) Explain the difference between *static* and *dynamic linking* giving one advantage of each. Which is most appropriate for an applet stored on a web site to be loaded into a browser?   [3 marks]