# Homework 4 Programming language Translators Answers

# 1. Give an example of a situation in which assembly code might be used rather than a high-level language. [2]

When coding for execution speed;

When coding to minimize object code size;

When writing code to control devices / directly access hardware;

# 2. Explain the differences between a compiler and an interpreter. [4]

A compiler produces object code/machine code; whilst an interpreter does not produce any object code;

Interpreted code will execute slower; than executing the object code produced by a compiler;

You always need the interpreter to interpret source code; but you do not need the compiler to execute a compiled program;

Once compiled source code is no longer required to run the program;

An interpreter always needs source code at runtime;

Compiled code can only be executed on a machine with the same processor type / instruction set;

# 3. (a) Explain what is meant by bytecode. [2]

 It is code which has been compiled into an intermediate form, but which is not itself executable.

 (b) Describe the advantage of compiling into bytecode rather than machine code. [2]

 It is portable, because each computer that can run it, for example Java, has a JVM or Java Virtual Machine (which is itself a program), that understands bytecode and converts it into the machine code required for that particular computer.

 [Total 10 Marks]