Question 1

a) Write down the structure of a Windows message loop. Make sure you include and explain all API calls in the message loop. You can use pseudocode.

(4 marks)

b)
    i.   What is the purpose of the *WndClassEx* structure?
    ii.   List and describe five commonly used fields in this structure.

(5 marks)

c) List and explain the arguments passed to the *DllMain* function.

(4 marks)

d) What is a *window message queue*? Give examples.

(4 marks)

e) When a process uses a DLL, is memory claimed by DLL functions taken up from the address space of the process or not? Explain your answer.

(2 marks)

f) Describe the structure of a Window *callback function*.

(6 marks)

[Total: 25 marks]

Question 2

a) Explain how c*ritical sections* may be used for thread synchronization. Give an example.

(5 marks)

b) Give an overview of how threads are scheduled in Windows.

(7 marks)

c) What is the difference between the *base priority* and the *relative priority* of threads in Windows?

(5 marks)

d) Write down short notes on the following:

    i.   Each thread has a *stack* for local variables and other data required.
    ii.   *Context switches*.
    iii.   The *ExitThread* API call.
    iv.   The *TerminateThread* API call.

(8 marks)

[Total: 25 marks]

Question 3

a) If a window hosts a number of child controls (such as combo boxes and list boxes), how does a programmer handle any messages related to these controls?

(5 marks)

b) How does painting/repainting work in Windows? In your explanation make sure to include references to the following:

      i.   *Device contexts*,
      ii.   Painting-related Windows messages,
      iii.   Paint structures,
      iv.   The Windows *GDI*.

(8 marks)

a) Write short notes on the following:

    Raster fonts;
    Vector fonts;.
    TrueType Fonts;
    OpenType Fonts.

(8 marks)

c) What is *implicit* and *explicit* linking (in the context of DLLs)?

(4 marks)

[Total: 25 marks]