ECE3073 Computer Systems

Practice Questions

Analogue Interfacing

(i) Draw a circuit diagram of an INVERTED R-2R LADDER digital to analogue converter.

(ii) By referring to the diagram you drew for part (i) explain the operation of the INVERTED R-2R LADDER digital to analogue converter.

(iii) List the advantages of the INVERTED R-2R LADDER digital to analogue converter.

(iv) Explain why the OUTPUT signal of a DIGITAL TO ANALOGUE CONVERTER is sometimes passed through a sample and hold circuit.

(v) Draw a diagram showing the major components of a PRACTICAL sample and hold circuit.

(vi) Explain the function of each of the components in your diagram of a sample and hold

(vi) Draw a diagram showing the major components of a single-slope analogue to digital converter.

(vii) Describe how the single-slope analogue to digital converter functions. Your description should incorporate the equations governing its operation.

(viii) Explain the advantages and disadvantages of the single-slope analogue to digital converter.

Calculation Questions

i) For a 10-bit digital to analogue converter with a 5 volt reference voltage and gain factor of 1 calculate the converter step size.

ii) For a 12-bit analogue to digital converter with a reference voltage of 10V what digital output (in binary) would you expect for an analogue input of 4.7Volts?

iii) For an 8-bit digital to analogue converter with a reference voltage of 12V what output voltage would you expect for a digital input of 0x15?

RAR 31/03/2012