Time: 3 Hours **Marks: 80**

N.B.: 1. Question No. 1 compulsory.
2. Attempt any Three out of remaining Five questions.
3. Figures to the right indicate full marks.
4. Draw neat diagram wherever necessary.

1. Solve any four out of five
   A) What are the design metrics of an embedded systems. 05
   B) Discuss working of stepper motor. 05
   C) Explain different types of kernals. 05
   D) Explain in brief Assembler Directives with respect to 8051 Assembler. 05
   E) List important features of ARM architecture.. 05

2. A) Describe priority inversion problem and explain how to resolve it? 10
   B) Explain various addressing modes of 8051 microcontroller. 10

3. A) Assuming crystal frequency = 11.0592 MHz, write an assembly language program for 8051 to generate square wave of 2 KHz at pin P2.5. Show necessary delay calculation. (Use Timer-0, Mode-0) 10
   B) List and explain how exceptions and interrupts handled in ARM7. 10

4. A) Write an assembly language program to generate triangular wave using DAC interfacing with 8051 micro controller. 10
   B) Explain various addressing nodes of ARM7 with suitable example instruction. 10

5. A) List discuss different features of Arduino and Raspberry-pi along with their schematic diagrams. 10
   B) Draw and Explain interrupt structure of 8051 microcontroller. 10

6. Write short notes on :
   A) SoC and DSP (Embedded system core) 06
   B) ARM development tools. 07
   C) Extended libraries of Arduino 07
