

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 kernels.   | 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 |