

T.E. (V) (CBUS) (EXTC)

19/5/15

Microcontrollers & applications

QP Code : 3378

(3 Hours)

[Total Marks : 80]

NB:

- 1) Question No. 1 is compulsory.
- 2) Out of remaining questions, attempt any three questions.
- 3) In all four questions to be attempted.
- 4) All questions carry equal marks.
- 5) Answer to each new question to be started on a fresh page.
- 6) Figures in brackets on the right hand side indicate full marks.
- 7) Assume suitable data if necessary.

- Q1. A) Explain Special Function Registers (SFRs) of 8051. (5 Marks)
 B) Explain features of ARM-7 microcontroller. (5 Marks)
 C) Explain 8051 assembler directives. (5 Marks)
 D) Explain Digital Camera as an embedded system application. (5 Marks)
- Q2. A) For an 8051 system of 11.059MHz. Find how long it takes to execute each of the following instructions. (10 Marks)
 a) MOV R3, #55 b) DJNZ R2, Target c) LJMP d) SJMP e) MUL AB
- B) Design a microcontroller system using 8051 microcontroller, 4 Kbytes of ROM and 8 Kbytes of RAM. Interface the external memory such that the starting address of ROM is 1000H and RAM is C000H. (10 Marks)
- Q3. A) Draw and explain data flow model of ARM-7 (10 Marks)
 B) Explain addressing modes of ARM-7 (10 Marks)
- Q4. A) Explain IR communication system with basic transmitter setup. (10 Marks)
 Write a program segment to vary speed of a DC motor using the remote transmitter keypad.
- B) Write a program for a square wave is being generated at pin P1.2. This square wave is to be sent to a receiver connected in serial form to this 8051. (10 Marks)
- Q5. A) What is stack? How stacks are accessed in 8051? Explain operations of PUSH and POP instructions with example. (10 Marks)
 B) Write a program to blink all LEDs connected to port P1 at a slow rate so that the blinking is clearly seen. Assume a frequency of 22 MHz and that the system is using the 89C51. Use a crystal of frequency 22 MHz (10 Marks)
- Q6. Write short notes on following (20 Marks)
 A) Design metrics of embedded systems
 B) PCON and SCON registers of 8051