

Time: 3 Hours

Marks: 80

Note:- Question no. 1 is compulsory.
Answer any three out of remaining questions.
Figures to right indicates full marks.
Assume suitable data wherever necessary.

- Q.1. Answer **any four** (20)
- a) Explain following instructions of 8051 microcontroller with example.
 - i) MOVX ii) CJNE iii) JB iv) AJMP v) SWAP
 - b) Draw and explain the PSW register of 8051 microcontroller.
 - c) Compare RISC and CISC architectures.
 - d) Draw interfacing diagram of 8051 microcontroller and DC motor. Explain the logic to rotate motor in clockwise and counter clockwise direction.
 - e) Draw APSR for ARM Cortex M3 and explain.
- Q.2. a) Draw and Explain the port structure of 8051 microcontroller. (10)
- b) Using CJNE instruction write a program to find how many positive numbers and negative numbers are there in an array from location 030H to 03AH? (10)
- Q.3. a) Draw and explain the internal RAM memory structure of 8051 microcontroller. Write an assembly language program to perform read and write to the internal RAM. (10)
- b) Discuss NVIC and MPU of ARM Cortex M3 processor. (10)
- Q.4. a) Interface temperature sensor LM35 with 8051 microcontroller and write assembly language program to display the temperature (2 digit) on 7 segment display. (10)
- b) Explain operation modes and states of ARM Cortex M3 processor with suitable diagram. (10)
- Q.5. a) Design a scheme using 8051 to accept input from 4 x 4 keyboard and display the key number on the LCD display. Write program using assembly language for the same. (10)
- b) Explain interrupt structure of 8051 with suitable diagram. Hence explain all SFRs associated with interrupt. (10)
- Q.6. a) Draw and interfacing diagram of 8051 microcontroller with DAC and write an assembly language program to generate triangular waveform. (10)
- b) Discuss 8051 Timer SFRs and write a program in assembly language to generate delay of 10msec. Show required calculations for the same. (Crystal = 11.0592MHz) (10)
