

(Time: 3 Hours)

[Marks: 80]

- N.B. : (1) Question No. 1 is **compulsory**.
- (2) Solve any **three** questions from the remaining **five**
- (3) **Figures** to the **right** indicate **full** marks
- (4) Assume suitable data if necessary and mention the same in answer sheet.

- Q.1 a) Draw and explain Program Status Word register of 8051. [5]  
 b) Explain 8051 Assembler directives. [5]  
 c) List the features of ARM7. [5]  
 d) Explain following ARM instructions: [5]  
 1) AND R1, R1, #5  
 2) LDR R0, [R2]  
 3) EOR R1, R0, #1  
 4) MVN R2, #05  
 5) ADD R2, R3, R3, LSL #2
- Q.2 a) Draw & Explain Internal memory organization of 8051 microcontroller. [10]  
 b) Write a program to copy the value 55H into RAM memory locations 40H and 41H using : [10]  
 (a) direct addressing mode,  
 (b) register indirect addressing mode without a loop, and  
 (c) with a loop.
- Q.3 a) Draw and explain the interrupt structure of 8051. [10]  
 b) Interface LCD to 8051 and write a program to display the message "LCD" on it. Draw the connection diagram of 8051 with LCD. [10]
- Q.4 a) Explain Serial communication of 8051 with the help of SCON register. [10]  
 b) Draw & Explain data flow model of ARM7. [10]
- Q.5 a) Explain Addressing modes of ARM7 Processor with example in each. [10]  
 b) Write assembly language program of ARM to implement following equation: [10]  
 $R0 = 3 \times R1 + 17 \times R2$   
 Without using multiply or multiply and accumulate instruction. Show calculation.
- Q.6 a) Explain the implementation of stack in ARM using load-store instructions. [10]  
 b) Suppose a LED is interface with P0.0 of ARM. Write embedded C language program to blink this LED with certain delay. Software generated delay may be used. [10]