

S.E. / ELX / Sem IV / CBCGS / R-19 / 'C' Scheme / Sub: - MA / S.H. 2024
Date: - 09/12/2024

(3 Hours)

[Total Marks: 80]

- N.B.:** (1) Question No. 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) Each question carries 20 marks and sub-questions carry equal marks.
 (4) Assume suitable data if required.

QP. Code: - 10056034

- Q1 Attempt any FOUR 20
 (a) Explain program, internal and external data memory of 8051. (5)
 (b) Explain assembler directives of 8051. (5)
 (c) What is the difference between long jump (LJMP), short jump (SJMP) and absolute jump (AJMP) (5)
 (d) Explain power saving mode of 8051 microcontroller. (5)
 (e) Draw the TCON and TMOD register structure. (5)
- Q2 (a) Explain addressing modes of 8051 with suitable examples. (10)
 (b) Write a program to copy the value 55H into RAM memory locations 40H and 45H using,
 i) Direct addressing mode (10)
 ii) Register indirect addressing mode without loop and
 iii) With a loop
- Q3 (a) Explain the structure of I/O ports of 8051 with neat diagram. (10)
 (b) Explain LCALL and ACALL instructions. Write a program to toggle all the bits of port 1 by sending to it the values 55H and AAH continuously. Put a time delay in between each issuing of data to port 1. (10)
- Q4 (a) Interface ADC804 to 8051. Write a program to monitor the INTR pin and bring an analog input into register A. Then call a hex to ASCII conversion and data display subroutines. Do this continuously. (10)
 (b) Explain interrupt structure for the 8051 with the priority structure. (10)
- Q5 (a) Interface stepper motor to 8051 and interface 4x4 matrix keyboard to 8051. (10)
 (b) A portable battery operative soil testing machine requires a controller card to be designed with following features,
 i) 8751 working at 12MHz
 ii) Firmware space required is 4K bytes.
 iii) A large storage space of 128K byte minimum is required for recording field data using bank and switching. (10)
 iv) Power down mode is to be activated by appropriate circuitry.
- Q6 Write short note on following
 i) Embedded C programming concept.
 ii) Difference between microprocessor and microcontroller (20)
 iii) Serial port and programming
 iv) Harvard and Von Neumann architecture.
