

2021

COMPUTER SCIENCE — HONOURS

Paper : DSE-A-3

(Embedded Systems)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **question no. 1** and **any four** from the rest.

1. Answer **any five** questions : 2×5
- (a) What are program lock bits?
 - (b) Draw the Power On Reset Circuit. What is the purpose of it?
 - (c) What is the purpose of port registers?
 - (d) What is the difference between CY and OV flags of PSW related to MCS-51?
 - (e) Which part of the internal RAM is related with PUSH and POP instructions?
 - (f) What would be the content of DPH after execution of MOV DPTR, #1234H instruction? Justify your answer.
 - (g) How many bytes of forward jump are possible for any DJNZ instruction?
 - (h) Highlight the main differences between PAL and FPGA.
2. (a) Explain the operation of LCALL instruction of MCS-51 with suitable example.
- (b) What is the purpose of SETB instruction? 7+3
3. (a) Implement the following using a PLD circuit. Where O1, O2, O3 and O4 are outputs.
- $O1 = A.B + A.B$
 $O2 = A.B$
 $O3 = 0$
 $O4 = 1$
- Explain it with suitable circuit diagram.
- (b) What is VHDL? 7+3
4. (a) Write a short note on SFRs (Special Function Registers) of MCS-51.
- (b) Write an Assembly language program with algorithm for MCS-51 to shift a block of 8 bytes of data, presently located from 60H to 67H, 1-byte up, so that the data is available from 61H to 68H. 5+5

Please Turn Over

5. (a) Explain the working of Port - 0 of MCS-51 with suitable diagram.
(b) What is SBUF? Explain its function. 6+4
6. (a) What are the different types of Unconditional jumps in MCS-51? Explain in brief with suitable example and diagram.
(b) What is an interrupt? Which SFRs are directly related to external interrupts of MCS-51? 7+3
7. (a) Show with a simple circuit to interface a LED to port 1.0 of a MCS-51 and make it to blink using an assembly language program.
(b) What is function of RET? 8+2
8. (a) What is the difference between Timer and a Counter?
(b) Explain with the help of simple hardware interfacing circuit with port 1.0 and P1.1 of MCS-51 connected to DC motor through a controlling module for direction control through software for a DC motor. 2+8
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