2025

ELECTRONICS — HONOURS

Paper : DSCC-3

(Microprocessor and Microcontroller)

Full Marks : 75

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** (compulsory) in **Group-I,** ***any three*** questions from **Q.2** to **Q.6** in **Group-II** and ***any four*** questions from **Q.7** to **Q.12** in **Group-III.**

Group – I

1. Answer ***any ten*** questions : 2×10

(a) What is meant by word-size?

(b) What is an ALU?

(c) Name two special purpose registers in 8085 microprocessor.

(d) What type of stack memory is used with 8085 μP?

(e) What do SID and SOD stand for?

(f) What is an machine cycle?

(g) What are INTR and INTA signals?

(h) What is an ALP?

(i) How many instructions does the 8051 μcontroller have?

(j) How many address lines are necessary on the chip of 2K(2048) byte memory?

(k) What is a microcontroller?

(l) Name of the microcontroller inside the Arduino Uno.

Group – II

2. Write a brief note on the control and status signals of 8085 μP. 2+3

3. What are addressing modes? Name the types of addressing modes of the 8085 microprocessor along with example instructions for each type. 2+3

4. What is a stack pointer? Explain the PUSH and POP instructions with the help of an example. 2+3

5. Write an Assembly Language Program to add two 8-bit numbers stored in two memory locations. 5

6. Name and explain in brief the roles played by the main components of an Arduino Uno microcontroller board. 5

Group - III

7. (a) The data bus and the lower order address bus of the 8085 microprocessor are multiplexed. What is meant by the above statement? Explain with a schematic circuit diagram, how you may demultiplex the two buses using a latch.

   (b) Explain the roles of the different flags in the 8085 microprocessor in brief. (2+4)+4

8. Draw the functional block diagram of the 8085 microprocessor comprising its registers, internal buses, timing and control unit etc. Explain in brief the roles played by the main constituent parts. 5+5

9. (a) What is a stack? Explain the role of a stack in the execution of a subroutine.

   (b) Show, using a block diagram, how a 4096×8 ROM chip may be interfaced to the 8085 microprocessor. (2+3)+5

10. What do the following instructions accomplish?

    (a) MOV A,B (b) DAD H (c) XCHG (d) INX B (e) JZ 8500H. 2+2+2+2+2

11. (a) Give a brief idea about the internal RAM structure of 8051 μcontroller.

    (b) Write a short note on PSW of 8051 μcontroller.

    (c) What is the difference between the SP register of an 8085 μP and an 8051 μcontroller? 5+3+2

12. Explain the use of the following instructions for the Arduino Uno :

    (a) pinMode() (b) setup() (c) loop() (d) analogRead() (e) delay(). 2+2+2+2+2