B.Sc. (Part–III) Semester—VI Examination

6S : ELECTRONICS

(Advanced Microprocessor and Microcontroller)

Time : Three Hours] [Maximum Marks : 80

Note :— (1) Question No. **1** is compulsory.
(2) Draw neat diagrams wherever necessary.

1. (A) Fill in the blanks with appropriate word :
   (i) The 8051 µc has _____ bytes of on chip RAM.
   (ii) Simplex mode allows data communication in _____ direction.
   (iii) 8086 µp can be operated in _____ operating modes.
   (iv) The data memory space in AVR can be maximum of _____ bytes. 2

   (B) Choose the correct alternative :
   (i) The address bus of 8086 µp is :
   (a) 8 bit (b) 16 bit
   (c) 20 bit (d) 32 bit
   (ii) Which register holds the address of next instruction in 8086 µp ?
   (a) SP (b) BP
   (c) IP (d) SI
   (iii) The instruction MOV R_n, A uses _____ addressing mode.
   (a) Immediate (b) Direct
   (c) Register indirect (d) Register
   (iv) A microcontroller normally has which of the following devices on-chip ?
   (a) ROM (b) RAM
   (c) I/O (d) All of the above 2

(C) Answer in **one** sentence each :

(i) State index registers of 8086 µp.

(ii) What is the flag register in the 8051 µc ?

(iii) State the function of program counter in 8051 µc.

(iv) What is the function of instruction MOV AX, [0500] ? 4

EITHER

2. (A) Explain the function of segment registers in 8086 µp. 4

(B) What is physical address ? How is it computed ? Explain with example. 4

(C) Explain the function of following pins of 8086 µp :

(i) $\overline{RD}$

(ii) $\overline{WR}$

(iii) $M/\overline{IO}$

(iv) $MN/\overline{MX}$. 4

OR

(P) Draw flag register of 8086 µp and explain the function of conditional flags. 4

(Q) Name and explain operating modes of 8086 µp. 4

(R) Draw a well labelled block diagram of 8086 µp and explain the function of ALU. 4

EITHER

3. (A) Explain the following instructions of 8086 µp :

(i) MOV AX, FFEEH

(ii) ADD AX, BX

(iii) INC AL

(iv) DEC AX. 4

(B) Write an ALP to subtract 1234 H from 5678 H and store the result in DS at 1000 : 0300 H. 4

(C) Explain PUSH and POP instructions of 8086 µp. 4

OR

(P) Write a program for multiplication of two 8-bit numbers 78H and 87 H using 8086 µp. 4

(Q) Explain DIV and IDIV instructions of 8086 µp. 4

(R) Explain with example register and immediate addressing modes of 8086 µp. 4

EITHER

4. (A) Differentiate between microprocessor and microcontroller. 4

(B) Explain the function of status bits RS_1 and RS_0 in PSW of 8051 µc. 4

(C) Explain the function of SP and PC register in 8051. 4

OR

(P) Explain the register banks of 8051 µc. 4

(Q) Draw the block diagram of 8051 and explain the function of registers A and B. 4

(R) State the salient features of 8051 µc. 4

EITHER

5. (A) Enlist addressing modes of 8051 and explain any two addressing modes. 6

(B) Write an assembly language program to subtract 1313 H from 6543 H and store the result in register R_6 and R_7. Draw a flow chart. 6

OR

(P) Explain the following instructions of 8051 :

(i) MOV A, # 12 H

(ii) ADD A, 35 H

(iii) MUL AB. 6

(Q) Write a program for multiplication of two 8-bit numbers. Assume suitable data. 4

(R) Explain SWAP A instruction of 8051. 2

EITHER

6. (A) Explain interfacing of DAC with 8051 µc with suitable diagram. 6

(B) How will you interface RS-232 with 8051 using MAX 232 chip ? Explain with suitable circuit diagram. 6

OR

(P) Distinguish between simplex, half duplex and full duplex modes of data transfer. 6

(Q) Explain the power saving options available in 8051 microcontroller. 6

EITHER

7. (A) Draw the block diagram of AVR ATmega 32 and explain the function of each block. 8

(B) Explain general purpose registers of AVR ATmega 32. 4

OR

(P) Explain flags of AVR microcontroller. 6

(Q) What are the power saving modes of AVR microcontroller ? Explain. 6