AU–174

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

6S : ELECTRONICS

(Advanced Microprocessor & 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 : 2

(i) Address bus of 8086 microprocessor is _____ bit.

(ii) _____ is a ROM-less microcontroller.

(iii) 8086 microprocessor has _____ bit flag register.

(iv) 8051 microcontroller has _____ addressing modes.

(B) Choose correct alternative : 2

(i) In 8086 microprocessor memory is segmented into _____ segments.

(a) 2

(b) 4

(c) 8

(d) 10

(ii) In 8086 microprocessor BIU stands for _____.

(a) Bus Interface Unit

(b) Bias Internal Unit

(c) Bidirectional Interface Unit

(d) None of the above

(iii) 8051 microcontroler has ___ bytes on chip RAM.

(a) 256

(b) 128

(c) 64

(d) 32

(iv) 8086 microprocessor has ___ byte queue register.

(a) 4

(b) 8

(c) 6

(d) 12

(C) Answer in **one** sentence only : 4

(i) State general purpose registers of 8086.

(ii) Name the pointer register of 8086.

(iii) Give the function of Instruction Pointer.

(iv) Write the instruction for addition of data in AX and BX register.

EITHER

2. (a) Explain operating modes of 8086 microprocessor. 4

(b) Explain control flag of 8086 microprocessor. 4

(c) Give the function of the following pins of 8086 :

(i) READY

(ii) MN/$\overline{MX}$

(iii) ALE

(iv) M/$\overline{IO}$. 4

OR

(p) What is the bus cycle ? Draw the timing diagram for memory read operation in minimum mode. 6

(q) Explain the function of :

(i) Index registers

(ii) Instruction queue

(iii) Stack pointer. 6

EITHER

3. (a) Explain data transfer and arithmetic instructions of 8086 microprocessor with one example of each. 6

(b) Draw flow chart and write ALP for addition of two 16-bit immediate data 1000 H in AX register and 2506 H in BX register. Store result in CX register. 6

OR

(p) Give the addressing mode of the following instructions :

(i) ADD AX, 4836H

(ii) MOV AX, [BX]

(iii) MOV AX, [BX + 1000H]

(iv) ADD[0301], AX. 4

(q) State the difference between MUL CX and IMUL CX. 2

(r) Explain based addressing mode, index addressing mode and based-indexed add mode of 8086 microprocessor with suitable example. 6

EITHER

4. (a) Explain flag register of 8051 microcontroller with diagram. Explain function of each flag. 8

(b) Differentiate between microprocessor and microcontroller. 4

OR

(p) Draw and explain block diagram of 8051 microcontroller. 8

(q) Explain various interrupts in 8051 microcontroller with their order of priority. 4

EITHER

5. (a) List the various addressing modes of 8051. Explain any two addressing modes with suitable example. 6

(b) Explain the function of the following instructions :

(i) ADDA,@Ro

(ii) MOVA, OFOH

(iii) SWAPA. 6

OR

(p) Explain data transfer and branch transfer instruction group of 8051 microcontroller. 6

(q) Draw flowchart and write ALP to add two 16-bit numbers 1234H and 4213H. Store the result in DPTR register. 6

EITHER

6. (a) Explain simplex, half and full duplex mode of data transmission. 6

(b) Explain interfacing of DAC with microcontroller, with suitable diagram. 6

OR

(p) What is serial communication ? Explain basics of serial communication in detail. 6

(q) Explain the interfacing of 8255 PPI with 8051 microcontroller with neat diagram. 6

EITHER

7. (a) Explain X-register, Y-register and Z-register used in ATmega 32A. 6

(b) Explain status register of AVR ATmega 32A microcontroller. 6

OR

(p) Explain SRAM data memory map of AVR ATmega 32A microcontroller. 6

(q) Explain the various power saving modes of AVR ATmega 32A microcontroller. 6