10. (a) Explain following SFRs :

(1) IE

(2) IP

(3) TMOD. 6

(b) Interface 8 KB RAM and 8 KB ROM with 8051. RAM should be interfaced in the data memory space and ROM should be interfaced in program memory space of 8051. 8

11. (a) Explain addressing modes of 8051. 5

(b) Explain following instructions of 8051 :

(1) MUL AB

(2) SWAP

(3) LCALL

(4) DJNZ byte, target. 8

**OR**

12. (a) Draw and explain interfacing of 8 bit DAC with 8051. Also write a program to generate sawtooth wave at DAC output. 8

(b) Draw and explain 4×4 keyboard interfacing with 8051. 5





**Faculty of Engineering & Technology**

**Fifth Semester B.E. (Electronics Engg.)/ET/EC (C.B.S.) Examination**

**MICROPROCESSOR AND MICROCONTROLLER**

Time : Three Hours] [Maximum Marks : 80

**INSTRUCTIONS TO CANDIDATES**

(1) All questions carry marks as indicated.

(2) Due credit will be given to neatness and adequate dimensions.

(3) Assume suitable data wherever necessary.

(4) Illustrate your answers wherever necessary with the help of neat sketches.

1. (a) Draw and explain internal architecture of 8086 in detail. 7

(b) Explain the function of following signals of 8086 :

(1) ALE

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

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

(4) $\overline{BHE} / S_7$. 6

**OR**

2. (a) Interface 64 KB ROM and 64 KB RAM memory with 8086. The starting address for ROM is B0000H. RAM should be interfaced immediately after the ROM address. 7

(b) Explain addressing modes of 8086 with one example each. 6

3. (a) Write a program to transfer 10 bytes of data from data memory segment to extra memory segment using 8086 instructions. 7

(b) Draw and explain interfacing of 8255 with 8086 from address 5000 H. 6

**OR**

4. (a) Draw and explain internal architecture of 8279 keyboard/display controller. 7

(b) Write short notes on :

(1) Sensor matrix mode of 8279

(2) Display modes of 8279. 6

5. (a) Interface 8254 with 8086 at suitable address. Also write a program to generate a square wave of frequency 1 KHz at counter 0. Assume 8254 runs at frequency of 1 MHz. 8

(b) Draw and explain internal block diagram of 8259. 6

**OR**



6. (a) Draw and explain mode word, command word and status word format of 8251. 8

(b) Draw and explain interfacing of 8251 with 8086. 6

7. (a) Draw and explain interfacing of 8086 with 8087 NDP. 7

(b) Explain following signals of maximum mode of 8086 :

(1) $\overline{S}_2$, $\overline{S}_1$, $\overline{S}_0$

(2) $QS_1$, $QS_0$

(3) $\overline{RQ}$ / $\overline{GT}$

(4) $\overline{LOCK}$. 6

**OR**

8. (a) Explain various transfer modes of 8237. 6

(b) Draw and explain internal block diagram of 8237. 7

9. (a) Explain memory organisation of 8051. 7

(b) Explain flag register of 8051. 4

(c) Explain dual role of port 0 and port 2 of 8051. 3

**OR**