B.E. (Electronics Engineering / Elect. Telecommunication / Elect. Communication Engineering)
Fifth Semester (C.B.S.)

Microprocessor & Microcontroller

P. Pages : 2 **NJR/KS/18/4464/4469**

Time : Three Hours * 0 2 0 7 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.
10. Use of non programmable calculator is permitted.

1. a) Draw & explain the internal architecture of 8086 microprocessor. **7**

b) Explain the following pins of 8086 microprocessor. **6**

i) $M | \overline{IO}$

ii) NMI

iii) $\overline{TEST}$

OR

2. a) Interface two IC's of 4 kB ROM and two IC's of 4 kB RAM with 8086 microprocessor. **8**

b) Explain indirect addressing modes of 8086. **5**

3. a) Write a ALP to find the smallest number from a set of 10 data bytes. Assume that the series is stored from memory location 5000: 4000 H. Store the result in DL register. **5**

b) Draw the architecture of 8279 PKDC and explain in brief. **8**

OR

4. a) Draw the block diagram of IC 8255 PPI and explain each block. Also explain CWR format of I/O mode of 8255. **7**

b) Interface 4 units of seven segment display with microprocessor 8086 using 8255 PPI, such that PORT A address will be 40H. Also write an ALP to display "2017" continuously. **6**

5. a) Interface 8254 with 8086 such that the address of counter 0 is 50H. Write an ALP to generate a square wave of period 1MS.
Assume 8086 operates at 6 MHz and 8254 operates at 1.5 MHz. **7**

b) Draw and explain architecture of IC 8259 PIC. **6**

OR

6. a) Interface 8251 USART with 8086 from address 80H. Initialize 8251 in asynchronous mode as a transmitter with one stop bit, even parity enabled, 8 bit character length, frequency 160 KHz and baud rate 10K. **7**

Write an ALP to transmit "WINTER 2017" serially & continuously.

b) Draw & explain all ICW's of 8259. **6**

7. a) Explain the following maximum mode pins. **6**

i) $\overline{RQ}$ / $\overline{GTo}$

ii) $\overline{LOCK}$

iii) $\overline{S}_2$, $\overline{S}_1$ and $\overline{S}_0$

iv) QS_1 and QS_0

b) Explain the operation of DMA 8237 in detail. **7**

OR

8. a) Explain the communication between 8086 and 8087 in brief with neat diagram. **7**

b) Discuss any three instructions of 8087. **6**

9. a) Draw and explain PSW of 8051 microcontroller. **7**

b) Interface 16 kB of RAM and 16 kB of ROM with 8051. **7**

OR

10. a) Write a program to make LED's ON-OFF alternately connected to part 1 of 8051 with neat interfacing diagram. **5**

b) Explain interrupt structure of 8051. Also explain IE and IP register. **9**

11. a) What do you mean by addressing mode? discuss the different addressing modes of 8051 microcontroller. **7**

b) Interface 8051 with stepper motor & write assembly language program to rotate the stepper motor in clockwise direction continuously. **7**

12. a) Write an 8051 ALP for transmitting "INDIA" serially. Use crystal frequency as 11.0592 MHz and set the baud rate at 9600 bauds. **5**

b) Write short note on **any two.** **9**

i) ADC interfacing with 8051.
ii) DAC interfacing with 8051.
iii) TMOD & TCON.

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