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Question Paper Code : 40454

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fifth / Sixth Semester

Electronics and Communication Engineering

EC 8691 – MICROPROCESSORS AND MICRO CONTROLLERS

(Common to Biomedical Engineering / Computer Science and Engineering/
Computer and Communication Engineering / Medical Electronics /
Information Technology)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the advantages of using the MOVS and CMPS instructions over the MOV and CMP instructions while working with strings?
2. If a data segment begins at address 2400H, what is the address of the last location in the segment?
3. Draw the timing diagram for an interrupt acknowledgement on an 8086 system.
4. List the features of multi core processors.
5. State the important functions of an I/O interface.
6. Calculate the resolution of an 8-bit A/D converter assuming the voltage range of the input as -10V to +10V.
7. Write an assembly language program to clear the accumulator and then add '3' to the accumulator ten times.
8. Why do 55H and AAH is used to test the ports of 8051?
9. Compare : microprocessor and microcontroller.
10. Which register has the SMOD bit, and what is its status when the 8051 is powered up?

PART B — (5 × 13 = 65 marks)

11. (a) Express the categories under which the instructions in the instruction set of the 8086 microprocessor are grouped. Explain the operation of any two instructions in each group.

Or

- (b) State the advantages of modular programming and illustrate the process by which the modules assembled separately are linked together and programs are prepared for execution.

12. (a) Differentiate between minimum and maximum mode of operation of 8086 microprocessor, and sketch the maximum mode configuration.

Or

- (b) Differentiate closely coupled and loosely coupled configurations of 8086 based multiprocessing systems, and illustrate the general concepts underlying the schemes for establishing priority in a loosely coupled multiprocessor system.

13. (a) Describe the operating modes and control words of Programmable Peripheral Interface (8255). Also specify the handshaking signals and their functions if port A of 8255 is setup as input port in mode 1.

Or

- (b) Discuss in detail the working of an independent DMA controller and its data transfer modes. Also, show the general organization of a one channel DMA controller and its principal connections.

14. (a) With a functional block diagram, briefly discuss the architecture of the 8051 microcontroller.

Or

- (b) (i) Discuss on the different types of addressing modes supported by the 8051 microcontroller with examples. (10)

- (ii) State the merits and demerits of accessing memory using various addressing modes. (3)

15. (a) In a certain application, 256K bytes of NV-RAM are needed to store data collected by an 8051 microcontroller. Show the connection of an 8051 to a single 256K × 8 NV-RAM chip.

Or

- (b) (i) Differentiate RET and RETI instructions. Explain why RET cannot be used as the last instruction of an ISR instead of RETI. (6)

- (ii) Illustrate the options available with Timer Mode (TMOD) register of 8051. (7)

PART C — (1 × 15 = 15 marks)

16. (a) Use a keyboard / display controller (8279) to interface a 64-key keyboard and an eight digit seven-segment display. Also discuss the working principle of 8279 with appropriate commands needed to be given before the CPU sends the characters to be displayed to the 8279 and before inputting data from the FIFO memory.

Or

- (b) Interface a temperature sensor to the 8051 microcontroller through an analog to digital converter and outline the steps to be followed to get data from analog input of ADC into the microcontroller.
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