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SARDAR PATEL UNIVERSITY
M.Sc. (PHYSICS) (IIIrd Semester) Examination
Friday, 28th October, 2016 2:00 pm to 5:00 pm
Course No.: PS03EPHY04

MICROPROCESSORS: PROGRAMMING, INTERFACING AND APPLICATIONS

- Notes: **Q.1:** Eight multiple choice questions (MCQ) carrying one mark each.
Q.2: Short answer questions carrying two marks each
(attempt any seven out of nine).
Q.3 to Q.6: Long answer questions carrying 12 marks each.

Total Marks:70

- Q.1(i)** _____ instruction is three byte instruction in the set of instructions for 8085 microprocessor. **(8)**
(a) MOV (b) MVI (c) LXI (d) RAL
- (ii)** Which of the following instruction is used to transfer data from register B to register A?
(a) MOV B A (b) MOV A B (c) MVI B A (d) MVI A B
- (iii)** A set of large data can be transferred effectively at higher rate using _____ data transfer technique.
(a) Synchronous, (b) Burst mode of DMA,
(c) Asynchronous, (d) None.
- (iv)** When a control word 98 H is used to initialize IC-8255, Port C_{upper} is programmed as
(a) Input port (b) Output port (c) strobed (d) None
- (v)** Which of the following interfacing device can be used as a square wave generator
(a) Intel-8253, (b) Intel-8255, (c) Intel-8259, (d) Intel-8257.
- (vi)** In the output stage of Sample and Hold circuit, which of the following is used to obtain low droop rate and low noise?
(a) MOSFET, (b) MESFET, (c) Bi-FET, (d) CCD.
- (vii)** If number of input lines are more than one to ADC, which of the following IC is used to connect them sequentially?
(a) DAC-0800, (b) AM-3705, (c) Intel-8255, (d) Intel-8257.
- (viii)** What will be the data required to output on Port C_{lower} of IC-8255 to send start-of-conversion S/C pulse through PC₃ pin when input line S₅ of analog inputs S₁ to S₈ is selected for ADC.
(a) 04 H, (b) 0C H, (c) 05 H, (d) 0A H.

- Q.2(a)** What is difference between machine language and assembly language? **(14)**
(b) Explain one byte, two byte and three byte instructions in brief.
(c) Explain how memory and I/O read/write control signals are generated by 8085 microprocessor?
(d) Write a programme to find two's complement of an 8 bit hexadecimal number.
(e) Define acquisition time and aperture time of a sample and hold circuit.
(f) What is IC Intel-8253? Mention its different programming modes. **PTO**

- (g) Explain in brief about the interrupts of Intel-8085 microprocessor.
(h) What are zero and full scale adjustments in case of analog to digital converter? Explain.
(i) Discuss how current and voltage can be measured using a microprocessor based scheme.

- Q.3(a)** Draw the block diagram of Intel-8085 microprocessor and explain the function of each block in brief. How many general purpose registers are available for operation of IC-8085? Why are they known as general purpose registers? (6)
(b) What are Opcodes and Operands? In case of 8085 microprocessor, how many opcodes are used? Write an assembly language programme at suitable memory location to add 12H and 2CH and store the result at 2600 H. (6)

OR

- (b) Draw the pin diagram of 8085 microprocessor. Mention the use of each pin briefly. (6)

- Q.4(a)** Write a note on data transfer schemes. (6)
(b) What are I/O ports? Discuss different ports of IC-8255 and explain how they are programmed in various modes of its operation. Also discuss the structure and meaning of control word. (6)

OR

- (b) Discuss in detail the application of programmable interrupt controller INTEL-8259. (6)

- Q.5(a)** Explain the following (6)
(i) Clock for A/D Converter
(ii) Analog Multiplexer AM 3705
(b) Sketch the circuit diagram showing interfacing of Analog multiplexer AM3705 and ADC 0800 with MPU 8085A and explain its application for ADC using a suitable assembly level programme. (6)

OR

- (b) Discuss the operating principle of D to A converter and explain the working of DAC 0800 with its interfacing diagram for uni-polar and bi-polar analog output. (6)

- Q.6(a)** Mention various ways by which one can introduce a time delay using a program. Give calculation of time delay introduced by a delay subroutine using single register. (6)
(b) What are common cathode and common anode LED display devices? Explain interfacing of MAN74A with 8085 MPU for display of decimal numbers 0-9 using a suitable assembly level programme. (6)

OR

- (b) How frequency and phase angle are measured with the help of MPU 8085? Explain. (6)

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