SARDAR PATEL UNIVERSITY

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M.Sc. (Physics) (IIIrd Semester) Examination

Day &Date :Monday, 29/10/2018

Time: 02:00 p.m. to 05:00 p.m.

Subject: MICROPROCESSORS: PROGRAMMING, INTERFACING AND APPLICATIONS

Paper No. : PS03EPHY24

Instruction: Figures to the right indicate marks.   **Total Marks : 70**

Q.1 Multiple choice questions   **[8]**

(i) _____ number of bits are unidentified in the flag register of 8085 microprocessor.

(a) 1,   (b) 7,   (c) 3,   (d) 5

(ii) _____ is a three byte instruction.

(a) MOV,   (b) MVI,   (c) HLT,   (d) LXI

(iii) Certain signals, called handshaking signals, are exchanged before real data transfer takes place between IO devices and memory through the microprocessor, when operating speed of both devices are _____.

(a) same,   (b) different,   (c) dependent on each other,   (d) none

(iv) When 99H is used as a control word for INTEL-8255, Port C$_{upper}$ is programmed as _____ port.

(a) input,   (b) output,

(c) first input and then output,   (d) none

(v) _____ IC is used to select one of eight inputs to appear at the output terminal.

(a) ADC-0800,   (b) DAC-0800,   (c) LF-398,   (d) AM-3705

(vi) The DAC-0800 produces output _____ equivalent to the applied digital input.

(a) Current,   (b) Voltage,   (c) Resistance,   (d) Capacitance

(vii) MAN 74A is _____ type seven segment LED display device.

(a) common cathode,   (b) common anode,

(c) both common cathode and common anode,   (d) none

(viii) In a delay subroutine, DCR B is executed for 16 times. If the number of states required for its execution is 4, then generated time delay by it is _____ millisecond.

(a) 0.2048,   (b) 0.0204,   (c) 0.4056,   (d) 2.0480

Q.2 Attempt any Seven of the followings: **[14]**

(i) Generate the equivalent eight bit representation of the instruction MOV A, C.

(ii) Discuss in brief about the buses of 8085 microprocessor.

(iii) Explain in brief how interrupts of 8085 are enabled and disabled.

(iv) How many counters are there in a programmable counter/interval timer IC-8252? How are they used to control timing sequences?

(v) What is ISS? Explain in reference to the interrupts of 8085.

(vi) How zero and full scale adjustments are made in case of ADC-0800? Explain in brief.

(vii) Sketch the circuit diagram of an ADC using DAC and explain its working in brief.

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(viii) What will be the conversion time of an analog input in to digital output by ADC-0800 if clock frequency of 50 kHz is used?

(ix) Which temperature sensors can be used in conjunction with a microprocessor? Mention their temperature limits.

Q.3(a) Write an assembly language programme to add two hexadecimal numbers 56H and 39H stored at memory locations 2500H and 2501H. [6]

Q.3(b) Enlist the registers used in 8085 microprocessor and explain their functions. In which register a first Op-Code goes during the execution of a programme? [6]

OR

Q.3(b) How many instructions and Op-Codes are there in a set of instructions of 8085 microprocessor? What are one byte, two byte and three byte instructions? Taking suitable example in each type, explain their use in an assembly level programme. [6]

Q.4(a) Discuss data transfer schemes used by a microprocessor based system. [6]

Q.4(b) Sketch the block diagram of Programmable DMA controller IC Intel-8257 and explain its working. [6]

OR

Q.4(b) With the help of neat diagram explain the working of Programmable interrupt controller IC Intel-8259. [6]

Q.5(a) What is the role of a sample and hold circuit in a real time data acquisition system? Explain the functioning of LF-398 and define acquisition time and aperture time. [6]

Q.5(b) Sketch the block diagram of an ADC-0800 and explain the working of each of its blocks. Also state electrical characteristic parameters of ADC-0800. [6]

OR

Q.5(b) Sketch an interfacing circuit of ADC-0800, AM-3705 and LF-398 with 8085 microprocessor and explain its operation. Also write different assembly level program segments to select input channel S_2 and S_5 out of S_0-S_8 channels. [6]

Q.6(a) Taking suitable examples, explain how time delay is introduced by delay subroutines. [6]

Q.6(b) Discuss different types of seven segment display devices and explain their working with the help of an interfacing diagram with INTEL-8085 microprocessor for multiple digital display. [6]

OR

Q.6(b) Discuss how following quantities of an ac wave are measured by a microprocessor based scheme. [6]

(i) Frequency

(ii) Phase angle

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