SARDAR PATEL UNIVERSITY
M.Sc. (PHYSICS) (IIIrd Semester) Examination
Tuesday, 28th April, 2015   2:30 pm to 5:30 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) Temporary register of MPU 8085 is   (8)
(a) used to hold memory address,   (b) accessible to programmer,
(c) not accessible to programmer   (d) none

(ii) The assembly language is recommended in _____
(a) real-time control applications.   (b) for small and simple programs
(c) when more computation is involved   (d) none

(iii) Which of the following is not a data transfer instruction.
(a) MOV r,data   (b) MVI M, data   (c) ADD r   (d) LDA addr

(iv) If $S_0 = 0$, $S_1 = 1$, it indicates _____ operations
(a) Read   (b) Write   (c) Fetch   (d) Execute

(v) Which of the following is not a programmed data transfer scheme?
(a) Synchronous data transfer scheme   (b) Interrupt driven data transfer scheme (c) Cycle stealing techniques of DMA data transfer (d) Asynchronous data transfer scheme

(vi) INTEL 8255 is
(a) Programable interrupt controller   (b) programmable peripheral interface   (c) programmable communication interface (d) none

(vii) S/H circuit LF398 is a monolithic IC that uses _____ technology to obtain high accuracy, fast acquisition of signals and low droop rate.
(a) BJT   (b) MOS   (c) BI-FET   (d) CCD

(viii) The most suitable temperature sensor for microprocessor based temperature measurement and control system is
(a) Thermocouple (b) semiconductor diode (c) pyrometer (d) none.

Q.2(a) Explain timing and control unit.   (14)
(b) Explain the instruction SIM.
(c) Explain DAA instruction.
(d) Write a programme to find two's complement of an 8 bit number.
(e) Explain what is " Vectored Interrupt" .
(f) What are triggering levels for various interrupts.
(g) Write the general format of a control word for 8255 and explain the meaning of each bit.
(h) Explain how clock for ADC is derived.

PTO

(i) Write the names and measurement ranges of different temperature sensors that are generally used with microprocessor based temperature monitoring and control system.

Q.3(a) What are various status flags provided in 8085? Discuss their roles. (6)
   (b) Discuss the function of the following signals of 8085. (6)
        INTR, SID, SOD, RST, S_0-S_1 and HOLD

OR

   (b) Discuss various instructions used for 16 bit data transfer. (6)

Q.4(a) Write an assembly language program to arrange a data set in an ascending order. (6)
   (b) Describe various data transfer schemes. (6)

OR

   (b) Draw a schematic diagram of Intel 8257 and discuss its important pins. (6)

Q.5(a) Discuss operating modes of IC 8255. (6)
   (b) Sketch a diagram of microprocessor based data acquisition system and explain in detail the use of analog multiplexer in it. (6)

OR

   (b) Give electrical characteristics of ADC 0800 and explain its working with the help of a neat interfacing diagram and a suitable assembly level programme. (6)

Q.6(a) Discuss internal registers of Intel 8259 programmable interrupt controller. (6)
   (b) With the help of a suitable assembly language programme explain how ADC can be realized using DAC. (6)

OR

   (b) Explain the thermocouple based temperature monitoring system with the help of interfacing diagram to 8085 MPU and a suitable assembly level programme. (6)

XXXXXXXXXX