

NF-129

December-2015

M.Sc., Sem.-III

503 : Physics

(Digital Electronics and Microprocessor-I)

Time : 3 Hours]

[Max. Marks : 70

- Instructions :**
- (1) Attempt **all** questions.
 - (2) **All** questions carry equal marks.
 - (3) Symbols and terminology have their usual meanings.
 - (4) Scientific calculator may be permitted.

1. (a) Draw circuit diagram of 9 bit parity generator and explain its working. 7
OR
Give internal block diagram and important specifications of IC 555.
- (b) Design mono stable multivibrator using IC 555 for a time period of 1 ms. 7
OR
Explain working of 4 bit up/down counter with necessary circuit diagram.
2. (a) With circuit diagram explain the working of a Successive Approximation type of ADC. What are its advantages and drawbacks ? 7
OR
Explain operation of 4 bit DAC using R-2R network & give its advantages.
- (b) (i) A Successive Approximation Register based ADC uses clock of 1 micro second; if the output is 10 bits find the highest frequency of signal which can be handled.
(ii) Analog input in the range 0 to 1000 mV is to be converted to digital of 16 bits. Calculate the step height in Volts. 7
OR
Discuss different kinds of displays.
3. (a) Draw (i) schematics of programmable machine, (ii) traditional block diagram of a computer and (iii) block diagram of a computer with the MPU as CPU. Discuss each one briefly. 7
OR
Discuss (i) Personal computers, (ii) Large computers, (iii) Micro computers.

- (b) Define a word (or word length). Give classification of the 8085 instructions and discuss each operations with relevant example. 7

OR

Discuss with relevant schematics (i) 8085 Hardware Model (ii) 8085 programming model and (iii) 8085 Flag Register

4. (a) Draw a schematic of 8085 single board Microcomputer system and discuss the 8085 MPU module, the 8085 machine cycle and bus timing. 7

OR

(i) What is a Latch ? Draw logic diagram and function table of 74LS373 D latch. Discuss D Flip-Flops : Latch and Clocked.

(ii) List the difference between the Decoder and the Encoder ? Draw a logic diagrams and functional table of 8 to 3 priority Encoder 74LS148.

- (b) Draw a Functional Block diagram of the 8085 Microprocessor system and discuss the ALU, Timing and Control Unit, Instruction Register and Decoder, Register Array. 7

OR

(i) What is a bus ? Discuss Demultiplexing the bus AD_7-AD_0 with relevant schematic.

(ii) Draw schematic of general Read/Write control signal for memory I/O.

5. Answer following questions briefly : 14

- (1) Name 4 ADC types.
- (2) The slowest ADC is _____.
- (3) Calculate resolution of an 8 bit DAC as percentage of full range.
- (4) Give pin diagram of IC 7495.
- (5) Draw waveforms of 2×5 counter.
- (6) What is use of Parity ?
- (7) Name different types of memories.
- (8) Draw pin out diagram of the 8085 microprocessor.
- (9) What is a buffer ?
- (10) What do you understand by tri-state devices ?
- (11) Draw a schematic of Microprocessor controlled temperature system.
- (12) What is the function of the flags ?
- (13) Give the difference between LSI, MSI and SSI.
- (14) What is an assembler ?