Indian Maritime University

(A Central University, Govt. Of India)

End Semester Examination Dec-2019/Jan-2020

B. Tech(Marine Engineering)

Semester -IV

Digital Electronics and PLC

UG11T3402

Date:02-01-2020	Max Marks:**70**
Time:3 Hrs	Pass Marks: **35**

Part – A (compulsory)

Answer the following (10x2=20 Marks)

1) Draw logic diagram of T flip-flop and give its truth table.
2) Define Resolution, Linearity of a Digital to Analog Convertor.
3) Construct OR gate using NAND gate.
4) Define: (i) Address bus (ii) Data bus.
5) List the different addressing modes of 8085.
6) Define fan-in and fan-out of a gate.
7) State different PLC programming languages used.
8) What is an IC tester.
9) What is HMI?
10) State De-Morgan's theorem.

Part – B

Answer any 5 out of 7 questions (5 x 10= 50 marks)

11) **a)** Explain full adder with its logic diagram & truth table.
b) Draw block diagram of PLC. Explain function of CPU, memory. (5+5)

12) **a)** State maintenance guidelines for PLC.
b) Explain with block diagram principle of Digital Voltmeter (5+5)

13) **a)** Draw and Explain the circuit of binary weighted resistor digital to analog converter (DAC).
. **b)** Explain with suitable circuit diagram and truth table for operation of J-K flip flop. (5+5)

14) **a)** Design 1:8 de multiplexer using 1:4 de multiplexer.
b) Write a program for 8085 microprocessor to Add the contents of memory locations 4000H and 4001H and place the result in memory location 4002H. (5+5)

15) **a)** Solve the following using K-map technique:
$f(a, b, c, d) = \sum m(0,2,3,5,6,7,8,10,11,14,15)$
b) Explain working of 2-bit ripple counter with diagram and truth table. (5+5)

16) **a)** Compare static and dynamic RAM.
b) List the silent features of Intel 8085 Microprocessor. (5+5)

17) **a)** Draw ladder diagram for 2 motor operation for following condition:
(i)Start push button start motor M1 & M2.
(ii) Stop push button stop motor M1 first & after 10 seconds motor M2.
b) Draw and explain SCADA architecture. (5+5)

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