INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

May/June End Semester Examinations
B.Sc. (Nautical Science) Fourth Semester
(AY 2013-14 to 2015- 16 batches only)

Nautical Electronics – IV (UG21T2405)

Date : 10.06.2017 Maximum Marks: 70
Time: 3 Hrs Pass Marks : 35

Note: Answer any seven of the following.
All questions carry equal marks. (7 x 10 marks = 70 marks)

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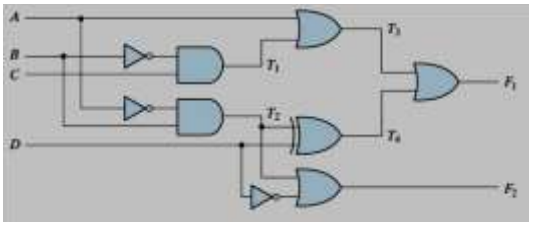
1. a) What is called universal gates? Implement AND, OR and NOT Gates by using NAND Gate. (5)

   b) State and verify De Morgan's theorems. (5)

2. a) Using Boolean techniques, simplify Y = AB + A (B + C) + B (B + C). (5)

   b) Explain Full adder circuit with truth table and logic diagram. (5)

3. Consider the combinational circuit shown below, derive the Boolean expressions for T_1 through T_4. Evaluate the outputs F_1 and F_2 as a function of the four inputs. (5 + 5)



4. a) Draw the internal structure of IC 555, explain the function of each pins. (5)

   b) Explain NAND gate as clock pulse generator. (5)

5. a) Explain RS latch with NOR Gates, with neat sketch and truth table. (5)

   b) Draw a logic diagram for JK flip flop, from truth table explain what is called toggle state. (5)

6. a) With neat sketch explain the working principle of 3 – bit ripple counter. (5)

   b) What is called non binary counter? Draw a neat sketch of 4 – bit decade counter and derive the truth table. (5)

7. a) Implement the following Boolean function with a multiplexer.
   $F(A, B, C, D) = \sum (0, 2, 5, 8, 10, 14)$ (5)

   b) Implement a full adder with two 4×1 multiplexers. (5)

8. Draw pin diagram and an internal architecture of 8085 microprocessor. (10)

9. a) Define Interrupts in 8085 processor and list the types. (5)

   b) Discuss programming model of 8085 processor. (5)

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