

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Govt. of India)

**May/June 2015 End Semester Examinations**

**SEMESTER – III, B.TECH ( MARINE ENGINEERING)**

**ELECTRONICS (T 2302 / T 1302)**

**Date: 10.06.2015**  
**Time: -3 Hrs**

**Max. Marks: 100**  
**Pass Marks: 50**

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**PART – A**  
**(Compulsory Questions)**

**(3 x 10 = 30 Marks)**

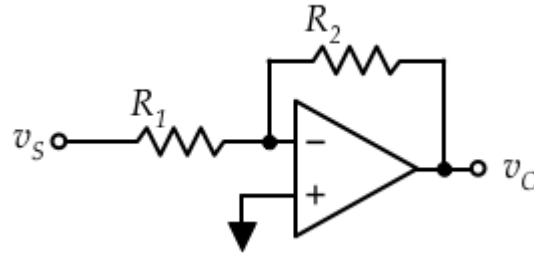
1. a) What are the differences between FET and MOSFET ?
- b) What are the advantages of common emitter amplifier?
- c) What is CMRR (Common Mode rejection Ratio) for an OPAMP.
- d) What are the importance of Q- point in transistor operation.
- e) Explain with block diagram principle of Digital Voltmeter.
- f) Explain the term feedback?
- g) How can you convert an NAND gate to a NOT gate ?
- h) What is a multiplexer?
- i) What is the function of ALU in 8085 microprocessor?
- j) Where do we use Modulation and modulation index ?

**PART – B**  
**(Answer any five of the following)**

**(5 x 14 = 70 Marks)**

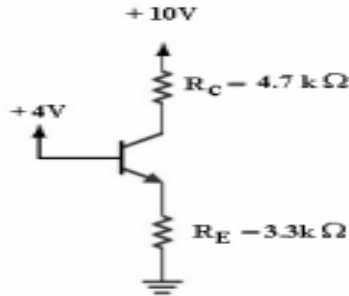
2. a) Explain with suitable circuit diagram and truth table for operation of XOR gate. (7)
- b) Design any 4 bit Counter. (7)

3. a) Explain with suitable circuit diagram and truth table for operation of J-K flip flop. (7)  
 b) In the circuit shown below  $R_1 = 8 \text{ k}\Omega$ . Assume that the op-amp is ideal. Determine the value of  $R_2$  so that the magnitude of closed-loop gain,  $G = v_O / v_S$  is 2. (7)



4. a) Write a program in assembly language (8085) to add two numbers. (7)  
 b) Simplify the following Boolean function by K-map method (7)  

$$f(A, B, C, D) = \sum (2, 3, 6, 7, 8, 9, 13, 15)$$
5. a) Explain advantages of FET over bipolar junction transistor. Describe the construction and working of a FET. (7)  
 b) Analyze the following circuit to determine branch currents (i.e.  $I_E$  &  $I_C$ ). Assume  $\beta = 100$ . (7)



6. a) Prove that in amplitude modulation (AM) total carrier power  $P_t = P_c (1 + m_a^2/2)$ . Where  $P_c$  is the carrier power and  $m_a$  is the modulation index. (7)  
 b) A broadcast transmitter radiates 5 KW, when the percentage modulation is 50 %. Calculate the total carrier power when the modulation has been reduced to 30 %. (7)
7. a) Write short note on (i) clipper and (ii) clamper circuit. (7)  
 b) Design and explain crystal oscillator. (7)
8. a) Briefly describe the operation of Cathode Ray Oscilloscope. (10)  
 b) What is negative feedback and where it is used? (4)

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