

***B.Tech. Degree IV Semester Examination in
Marine Engineering June 2013***

MRE 404 MARINE ELECTRONICS

Time : 3 Hours

Maximum Marks : 100

- I. (a) Derive the maximum efficiency of class B power amplifier. (10)
 (b) What is cross over distortion? How can it be rectified? (5)
 (c) Explain the basic design considerations of heat sink. (5)
- OR**
- II. (a) Draw and explain the block diagram of an operational amplifier. (10)
 (b) List the ideal characteristics of an OPAMP. (5)
 (c) Explain the terms:
 (i) Virtual ground (5)
 (ii) Input offset voltage.
- III. (a) Prove that NAND and NOR are universal gates. (10)
 (b) What is race around condition? How is it avoided in JK flipflop? (5)
 (c) Convert JK flip flop to T and D flip flops. Give one application each of JK, T and D flip flops. (5)
- OR**
- IV. (a) What is a multiplexer? Explain the operation of 4 to 1 line multiplexer. (10)
 (b) Explain the terms resolution and conversion time of ADC. (4)
 (c) Explain the working of a counter type ADC. (6)
- V. (a) Draw a two input TTL NAND gate and explain its operation. (10)
 (b) What is a totem -pole arrangement? What is its advantage? (4)
 (c) Explain how an inverter can be realized using MOS circuit. (6)
- OR**
- VI. (a) Define latching and holding currents of SCR. (5)
 (b) Describe the working of a single-phase half bridge inverter. (10)
 (c) What is the purpose of connecting diodes in anti parallel with thyristors in inverter circuits? (5)
- VII. (a) Define modulation index. With the help of waveform, explain the modulation index of AM and FM. (8)
 (b) Draw and explain super heterodyne receiver. (12)
- OR**
- VIII. (a) Explain the principle of RADAR. (5)
 (b) Draw and explain PCM. (10)
 (c) What is quantisation error? How can it be minimized? (5)
- IX. (a) With the help of a schematic diagram, explain the working of CRO. (15)
 (b) Differentiate (5)
 (i) Electrostatic and electro magnetic CRT
 (ii) Dual beam and dual trace CRO.
- OR**
- X. (a) What is a Q meter? Explain the series connection and parallel connection Q meters. (10)
 (b) Explain the operation of a frequency meter with the help of a block diagram. (10)