

B.Tech Degree IV Semester (Supplementary) Examination in Marine Engineering, July 2008



MRE 404 MARINE ELECTRONICS

Maximum Marks : 100

- I a) Derive the expressions for the maximum efficiency of class A and class C amplifiers. Mention the applications of class C amplifiers. (10)
 b) Draw the circuit of a difference amplifier using OP-AMP. Derive the expression for gain. Discuss ideal OP-AMP characteristics. (10)
- OR**
- II a) Draw the circuit of a class B push-pull amplifier. Explain the working. (8)
 b) What is distortion in amplifiers? Explain the different types of distortions in detail. (12)
- III a) What is multiplexer? Explain the concept with the structure of an 8X1 MUX. Implement the $f = \sum m(1, 3, 5, 7, 8, 11, 12)$ using 8X1 MUX and discrete gates. (10)
 b) Which are universal gates? Why they are called so? Prove your answer with circuits. Implement $y = \overline{ABC} + \overline{A\overline{B}C} + \overline{AB\overline{C}}$, using NOR gates alone. (10)
- OR**
- IV a) Draw the circuit of a mod – 6 counter using D flip flop and explain the working. (9)
 b) Explain the working principle of dual slope ADC with schematic diagram and relevant waveforms. (11)
- V a) How semiconductor memories are classified? Differentiate between static and dynamic RAM. (11)
 b) What is an opto – isolator. Explain the structure, working and one application. (9)
- OR**
- VI a) Draw the circuit of a TTL NAND gate and explain the working. (10)
 b) With circuit diagram and waveforms, explain the working of fully controlled rectifier with SCR. (10)
- VII a) Write short notes on PWM, PPM and PCM. (12)
 b) Explain any one scheme for AM demodulation. (8)
- OR**
- VIII a) What is the need for modulation? Explain the various types of modulation. (10)
 b) Draw the block diagram of a TV receiver and explain the working. (10)
- IX a) Draw the block diagram of a CRO and explain the working. What are the possible measurements using a CRO? (12)
 b) Write a note on signal generators and their standard outputs. (8)
- OR**
- X a) Define Q – factor . Explain the schematic of an electronic Q – meter. (12)
 b) Explain the principle of frequency meter. (8)