

--	--	--	--	--	--	--	--

***B.Tech. Degree IV Semester Supplementary Examination in
Marine Engineering June 2024***

**MRE 1404 MARINE ELECTRONICS
(2013 Scheme)**

Time: 3 Hours

Maximum Marks: 100

Answer *ALL* questions

(5 × 20 = 100)

- I. (a) With neat circuit diagram explain Complementary Symmetry Push-Pull Class B Amplifier. (10)
 (b) Differentiate Class A and Class B power amplifiers in detail and give their applications. (10)
- OR**
- II. (a) What do you mean by operational amplifier? List and explain ideal op-amp characteristics. (10)
 (b) Describe the two main configurations of operational amplifier with appropriate circuit diagrams. (10)
- III. (a) Explain De-Morgan's theorem. Minimise the expression using Boolean postulates and laws: $f(A, B) = \overline{AB} + \overline{A} + AB$. (10)
 (b) Which gates are called as universal gates? Why are they called so? Derive the AND, OR, NOT, XOR gates from universal gates. (10)
- OR**
- IV. (a) What are shift registers? Explain it with a neat diagram 3-bit serial input serial output shift register. (10)
 (b) Draw the circuit diagram of any one type of ADC and explain its working and applications. (10)
- V. (a) Explain how SCR is used for power rectification. (10)
 (b) Describe the working of CMOS NAND gate along with circuit diagram. (10)
- OR**
- VI. Explain how RAM, ROM and PROM act as memories. (20)
- VII. (a) Draw the block diagram of radio transmitter and explain its working principle. (10)
 (b) Explain RADAR communication system using suitable block diagram. (10)
- OR**
- VIII. (a) What is modulation? Explain the need for modulation. (10)
 (b) Differentiate amplitude modulation, frequency modulation and phase modulation. (10)
- IX. (a) Elaborate the flag register of 8085 microprocessor with example. (7)
 (b) Write short note on general purpose registers of 8085 microprocessor. (3)
 (c) Write an 8085-microprocessor assembly language program (along with algorithm and necessary comments) to multiply two 8-bit numbers at memory location 9000H and 9001H. Store the result at 9002H. (10)
- OR**
- X. (a) Draw and explain the architecture of 8085 microprocessor in detail. (10)
 (b) Write an 8085-microprocessor assembly language program (along with algorithm and necessary comments) to evaluate the function $Y = X^2$, where X is a number stored at memory location 9000H. Store Y at 9001H. (10)