B.Tech. Degree IV Semester Supplementary Examination in Marine Engineering April 2021

MRE 1404 MARINE ELECTRONICS
(2013 Scheme)

Time: 3 Hours   Maximum Marks: 100

$(5 \times 20 = 100)$

I.   (a)   Differentiate between class A, B, AB and C power amplifiers.   (10)
     (b)   With neat diagram, explain a Class B push-pull amplifier.   (10)

OR

II. (a)   Explain ideal op-amp characteristics.   (8)
     (b)   Explain the inverting and non-inverting configuration of an op-amp with   (12)
           feedback and derive the expression for voltage gain in both.

III. (a)   What are universal gates? Explain. Derive the basic gates from universal   (6)
           gates.
     (b)   What are D-flip-flop and T-flip-flop? Explain.   (10)
     (c)   State and prove De-Morgans theorem.   (4)

OR

IV. (a)   Draw and explain a synchronous decade counter.   (10)
     (b)   What is DAC? Where is it used? Explain any one type of DAC using neat   (10)
           sketches.

V.   (a)   Draw a 2-input TTL NAND gate and explain its operation.   (10)
     (b)   Write notes on semiconductor memories.   (10)

OR

VI. (a)   With the help of a neat diagram and waveforms, explain the working of a   (10)
           fully controlled rectifier.
     (b)   Explain latching current, holding current, forward blocking mode, forward   (10)
           conduction mode and reverse blocking mode of SCRs.

VII. (a)   Draw and explain the block diagram of a communication system.   (10)
     (b)   Explain pulse communication. Why is it advantageous?   (10)

OR

VIII. (a) Derive the basic RADAR range equation.   (10)
      (b) Explain the working of a super-heterodyne radio receiver with a neat   (10)
           schematic.

IX. (a)   Explain the architecture of 8085 microprocessor.   (12)
     (b)   Write an assembly language program to divide two hex numbers in   (8)
           location 9000H and 9001H and store the result in memory location 9002H
           and 9003H.

OR

X.   (a)   Explain the different category of instruction set in 8085 microprocessor.   (6)
     (b)   Explain different registers and register pairs in 8085 microprocessor.   (6)
     (c)   Write an assembly language program to find factorial of a number stored in   (8)
           location 9000H and store the result in 9001H.

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