B.Tech. Degree IV Semester Examination in Marine Engineering May 2018

MRE 1404 MARINE ELECTRONICS
(2013 Scheme)

Time: 3 Hours   Maximum Marks: 100

$(5 \times 20 = 100)$

I.   (a) Draw the circuit of series-fed and transformer coupled configurations of Class A power amplifier and derive the expressions for collector efficiency in both cases.   (12)
     (b) Explain Thermal Runway and Heat sinks.   (8)

OR

II. (a) Draw and explain the circuit of a voltage follower and an inverting amplifier. Derive the voltage gain for these circuits.   (10)
     (b) Describe any five characteristics of a practical Op-Amp.   (10)

III. (a) State and prove De-Morgans theorem.   (5)
     (b) Expand the function $f(A, B) = \overline{A} + \overline{B}$ to minterms and maxterms.   (6)
     (c) Reduce the following function using K-map: (9)
         $F = \sum m\ (2, 3, 6, 7, 8, 10, 11, 13, 14)$.

OR

IV. (a) Design synchronous 3-bit up counter using J – K flip flop.   (10)
     (b) Explain any one DAC using neat diagrams.   (10)

V.   (a) Draw and explain TTL and CMOS NOR gates.   (10)
     (b) Briefly explain semiconductor memories.   (10)

OR

VI. (a) Explain the structure of SCR and explain its working based on two transistor analogy.   (10)
     (b) What are photo electric devices? Explain photo emissive cells, photo conductive cells, photo voltaic cells and photo junction devices.   (10)

VII. (a) Explain with a neat diagram Super heterodyne Receiver.   (10)
     (b) Write short note on satellite communication.   (10)

OR

VIII. (a) Write short notes on AM, FM and PM.   (10)
      (b) What is modulation and demodulation? Explain the need for modulation. (10)

IX. (a) Explain the architecture of 8085 microprocessor.   (12)
     (b) Write an assembly language program to subtract two 8-bit numbers stored at locations 9000H and 9001H and result stored at 9002H.   (8)

OR

X.   (a) Explain the multiplexing and de-multiplexing of address/data bus in 8085 microprocessor.   (10)
     (b) Write an assembly language program to find whether the number at location 9000H is even or odd and output 00H if even and FFH if odd to location 9001H.   (10)

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