

BT-MRE-I & II/05.15-0564

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B

***B.Tech. Degree I & II Semester Examination in
Marine Engineering May 2015***

MRE 1108 FUNDAMENTALS OF ENGINEERING II

(Use separate answer books for Section A and Section B)

Time: 3 Hours

Maximum Marks: 100

**SECTION A
ELECTRICAL AND ELECTRONIC MEASUREMENTS**

- I. (a) Explain the different types of controlling devices in measuring instruments with their advantages and disadvantages. (8)
(b) What are the various moving iron instruments used for measurements? Explain the working principle. (8)
- OR**
- II. (a) Explain the working principle of dynamometer type instruments with neat diagram. (8)
(b) Briefly explain the process of extension of range of voltmeters and ammeters. (8)
- III. (a) Explain the two wattmeter method for measurement of three phase power with suitable circuits and equations. (10)
(b) Draw and explain the circuit diagram of an energy meter. (7)
- OR**
- IV. (a) Explain the various accurate methods of measuring capacitance by the use of bridges. (10)
(b) Explain the basic principle of operation of potentiometers. Give its applications. (7)
- V. (a) Explain the process of localization of a cable fault. (6)
(b) What is the basic principle of a transducer? Explain its application in measurement of pressure, flow, temperature and illumination. (11)
- OR**
- VI. (a) Explain the construction, working and applications of CRO. (11)
(b) Write short notes on digital voltmeter. (6)

(P.T.O.)

SECTION B
BASIC ELECTRONICS ENGINEERING

- I. (a) Explain photoelectric emission. Give an application. (4)
 (b) Draw and explain voltage-current relationship of PN junction under forward and reverse biased conditions. Also explain zener breakdown. (6)
 (c) Explain the need for biasing a transistor. Explain fixed biasing with all loop equations and dc load line. (8)
- OR**
- II. (a) Explain the effect of positive and negative feedback in transistor amplifiers. (4)
 (b) Explain common emitter transistor configuration with its characteristic curve. (6)
 (c) Draw and explain single stage RC coupled amplifier and its frequency response. (8)
- III. (a) Write short notes on: (8)
 (i) SCR (ii) DIAC (iii) UJT
 (b) Explain the construction, working and characteristics of JFET. (8)
- OR**
- IV. (a) Explain the principle and working of a bridge full wave rectifier, with a neat circuit diagram. (4)
 (b) Explain with a neat circuit diagram, the working of a transistor series voltage regulator. (6)
 (c) Design and draw a simple zener voltage regulator for the following requirements: (6)
 Output Voltage $V_{out} = 5.6$ V, Load current $I_L = 5$ mA, Input voltage range = 10 ± 3 V (Select a zener diode with power output $P_o = 0.33$ W and $V_z = 5.6$ V)
- V. (a) Explain Bark Hausen's criteria for sustained oscillations. (4)
 (b) Draw and explain any one positive clipper circuit. (4)
 (c) Draw and explain astable multivibrator. (8)
- OR**
- VI. (a) Explain the working of a LC tank circuit. (4)
 (b) Explain a biased negative clamper with circuit and waveforms. (4)
 (c) Explain the working of RC phase shift oscillator with suitable diagrams. Also explain how the phase shift is obtained using RC networks. (8)
