INDIAN MARITIME UNIVERSITY

(A CENTRAL UNIVERSITY, GOVT. OF INDIA)

SEMESTER- I, B.TECH. (MARINE ENGINEERING) – JUNE 2014 EXAMS

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (T 1104/ T 2104)

Time:- 3 Hrs **Max Marks : 100**
Date: 26.06.2014 **Pass Marks : 50**

PART - A **(10 X3 = 30 Marks)**

Compulsory Questions

1. (a) The sticker on a compact disc player says that it draws 288 mA of current when powered by a 9 V battery. What is the power of a CD player?
   (b) Define a network and a node.
   (c) What is called magnet? How it is classified?
   (d) Define Impedance.
   (e) Write down the instantaneous voltage equation and draw the phasor diagram for three – phase system.
   (f) Define illumination.
   (g) What is called semiconductor? How it is classified.
   (h) What is Zener Diode? Draw the characteristics curve for a zener diode and label it.
   (i) What is called rectifier? Draw the output waveform of half wave rectifier.
   (j) Why NPN transistor is most widely used?

PART - B **(5 X14 = 70 Marks)**

Answer Any Five of the following

2. (a) Discuss Kirchhoff's Current law and Voltage law with neat sketch and necessary equations. (7)
   (b) Explain briefly about electro static induction with neat sketch. (7)
3. (a) Draw hysteresis loop and explain briefly the various parts on it. (7)
   (b) Two 200 turn, air cored solenoids, 25 cm long have a cross sectional area of 3 cm^2 each. The mutual inductance between them is 0.5 μH. Find the self inductance of the coils and the coefficient of coupling. (7)

4. (a) A sinusoidal voltage v = 50 sin wt is applied to a series RL circuit. The current in the circuit is given by i = 25 sin (wt – 53^0). Determine the (7)
(i) Apparent Power (ii) Average Power and (iii) Power factor.

(b) A 100 V, 50 Hz supply is applied across the series circuit consisting of R = 10 Ω , L = 1 mH, and C = 20 μF. Find the input current and voltage across each element. (7)

5. (a) What is called transducer? How it is classified? What are the basic requirements of a transducer? (2 + 1 + 4)

(b) A 230 V single phase energy meter has a constant load current of 10 A at unity power factor. If the aluminum disc in the meter is meter makes 1200 revolutions in 3 hours, calculate the energy meter constant in revolutions per kwh. (7)

6. (a) Distinguish among Intrinsic and Extrinsic semiconductor. (7)

(b) What is a diode? How depletion layer is formed in diode? (2 + 5)

7. (a) Differentiate between avalanche breakdown and zener breakdown. (7)

(b) Write a short note on photoelectric emission and electric field emission. (7)

8. Explain the input and output characteristics of a transistor in common base configuration. (14)

9. (a) Explain the working principle of full wave bridge rectifier with neat sketch. (7)

(b) Discuss diode clamper with neat sketch. (7)

****