INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

END SEMESTER EXAMINATIONS-JUNE/JULY 2019

B.Sc (Nautical Science)

Semester-II

APPLIED PHYSICS AND ELECTRICITY (UG21T3202)

Date: 27.06.2019 **Max.Marks : 70**

Time: 3 Hrs **Pass Marks : 35**

Note:

Question No. 1 is compulsory

Answer any 6 Questions from remaining 8 questions (each of 10 marks)

Scientific calculator is permitted if required.

PART – A (5 × 2 = 10 Marks)

1. a) Define self inductance of a coil and mutual inductance between two coils.

   b) Define Q-factor.

   c) State Maximum Power Transfer theorem.

   d) Define the terms rms value and average value of AC.

   e) State Joule's law of electrical heating.

PART-B (6 ×10 = 60 Marks)

2. a) State and explain the Laws of Induction. (5 Marks)

   b) The self inductance of a coil of 500 turns is 0.25 H. If 60% of the flux is linked with a second coil of 10,000 turns, Calculate (i) The mutual inductance between the two coils. (ii) emf induced in the second coil when the current in the coil changes from 5A to -5A in 0.1 second. (5 Marks)

3. a) Define AC voltage. How AC is produced? (5 Marks)

   b) A circuit contains a non-inductive resistance of 50 ohms, an inductance of 0.3H and a resistance of 2 ohms and a capacitance of 40μF in series and is supplied with 200 V at 50 Hz. Find the

impedance of the circuit, current lag or lead, behind the voltage?

(5 Marks)

4. a) With a neat diagram, explain the working of a Hay's bridge and derive the equation.

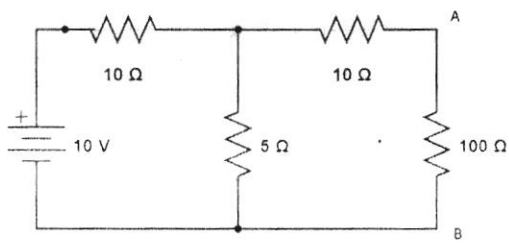
(5 Marks)

b) The arms of an ac Maxwell bridge are arranged as follows. AB is a non inductive resistance of 600 Ω, CD is an inductive impedance (unknown) and DA is a non inductive resistance of 400 Ω. If balance is obtained under these conditions, find the value of the resistance and the inductance in the branch CD.

(5 Marks)

5 a) State and explain Norton's theorem. (5 Marks)

b) Use Thevenin's theorem to find the current through the load resistance of 100 Ω in the given circuit



(5 Marks)

6 a) With a neat sketch explain the working of AC generator.

(5 Marks)

b) What is thermoelectric effect? Explain the terms Seebeck effect and Peltier effect in thermo electricity.

(5 Marks)

7 a) What is a Thermistor? Give its application. (5 Marks)

b) Explain the working of a sound level meter. (5 Marks)

8.a) Explain the working of Series and Shunt type DC motor. (5 Marks)

b) Explain the working of a Venturimeter. (5 Marks)

9. Write Short notes on any TWO.
   a) Resistors in Series and Parallel (5 Marks)
   b) Calibration, Accuracy, Precision (5 Marks)
   c) Superposition Theorem (5 Marks)
   d) Heaters and Fuses (5 Marks)