INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

End Semester Examination Dec 2019/Jan 2020

B.Sc. (Nautical Science)

Semester -II

UG21T3202 - Applied Physics & electricity

Date: 03.01.2019 **Max Marks: 70**

Time: 3 Hours **Pass Marks: 35**

PART-A

(Compulsory question)

(5×2=10)

1. a) Define coupling coefficient.

   b) Define Resonant frequency.

   c) Define Quality factor of a coil.

   d) State Kirchhoff current and voltage law.

   e) Define the term Precision.

PART-B

(Attempt any six questions out of eight)

(6×10=60)

2. a) State and explain the faradays law of electromagnetic induction. (5)

   b) Magnetic field through a coil having 200 turns and cross sectional area $0.04m^2$changes from $0.1wbm^{-2}$ to $0.04\ wbm^{-2}$ in 0. 02S.find the induced emf. (5)

3. a) What do you understand by the terms power factor, active power and Reactive power. (5)

   b) A resistance of 20Ω and an inductance of 0.2 H and a capacitance of 100μF are connected in series across 220 V ,50 Hz main supply. Determine the following a)impedance b)current c)voltage across R,L and C. (5)

4. a) Explain with neat sketch, the desauty bridge network and arrive at the

equations. (5)

b) The four arms of a Hays ac bridge are arranged as follows. (5)

AB is a coil of unknown impedance.

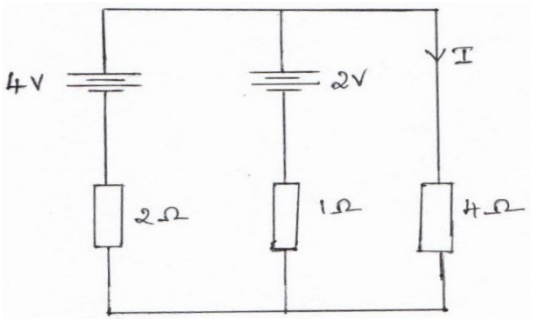
BC is a non-reactive resistor of 1000Ω

CD is a non-reactive resistor of 833Ω in series with a standard capacitor of 0.38μF

DA is a non-reactive resistor of 16,800Ω.if the supply frequency is 50Hz.determine the inductance and the resistance at the balance condition.

5. a) State and explain Thevenins Theorem. (5)

b) Solve using Norton's Theorem. (5)



6. a) Explain with neat diagram, principle, construction and working of DC generator. (5)

b) An a.c generator consists of a coil of 10,000 turns and of area 100 cm^2.The coil rotates at an angular speed of 140 rpm in a uniform magnetic field of 3.6×10^{-2} Find the maximum value of the emf induced. (5)

7. a) What is thermistor and how it is applied as a heat sensor. (5)

b) Explain the Series and Shunt type DC motors. (5)

8. A four arm bridge ABCD consists of

AB-fixed resistor R1

BC-a variable resistor R2 in series with a variable capacitor C2.

CD- a fixed resistor R3.

DA –a coil of unknown resistance R and inductance L.

Determine the values of R and L, if at balance, R_1= 1KΩ, R_2 = 2.4 KΩ, C_2=4000 pf, R_3= 1KΩ

And the supply frequency is 1.6 kHz. (10)

9. Write short notes on any two. (2X5=10)

a) Millman Theorem.

b) Transducer.

c) Heating effect of electric current.

d) Venturitube.

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