INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)
End Semester Examinations- June-July 2019
Semester – I
B.Tech (Marine Engineering)
Basic Electrical & Electronics Engineering (UG11T1104/ UG11T2104)

Date: 16-07-2019   Maximum Marks: 100
Time: 3 Hrs   Pass Marks: 50

Part-A

(All questions are compulsory)   (10 X 3 =30 Marks)

1. (a) Define node and loop of a circuit.

   (b) Define inductive reactance and capacitive reactance.

   (c) Write down the instantaneous voltage equation and draw the Phasor diagram for three phase system.

   (d) Define reluctance and Hopkinson's leakage coefficient.

   (e) What is called power factor and what its maximum and minimum value.

   (f) Differentiate between P type and N-type semiconductor(write any three point).

   (g) What is the importance of controlling torque in indicating instrument?

   (h) What is Zener diode? Draw the characteristic's curve for a Zener diode and label it.

   (i) What is transistor & draw the circuit diagram of the two type transistor.

   (j) Define trickle charging?

Part B

(Answer any five of the following)   (5 X 14 = 70 Marks)

2. (a) Discuss Kirchhoff's current law and voltage law with neat sketch and necessary condition.   (7)

(b) Derive an expression for the maximum power transferred in a circuit, assuming appropriate parameters. (7)

3. (a) Derive the expression for total inductance when two solenoids are connected in series? (7)

(b) A solenoid with 900 turns has a total flux of 1.33×10^{-7} Wb through its air core when the coil current is 100 mA. If the flux takes 75 ms to grow from zero to its maximum level, calculate the inductance of the coil. Also, determine the counter-emf induced in the coil during the flux growth. (7)

4. (a) If an AC power supply of 100V, 50Hz is connected across a load of impedance, 20 + j15 Ohms. Then calculate the current flowing through the circuit, active power, apparent power, reactive power and power factor. (7)
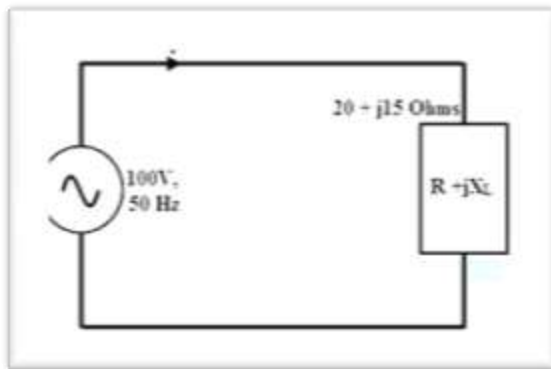
(b) Derive the expression for the resonant frequency in series RLC circuit. (7)

5. (a) Explain the working principle of permanent magnet moving coil instrument with neat sketch and its construction. (7)

(b) A 220 V single phase energy meter has a constant load current of 5 A at unity power factor. If the aluminum disc in the meter makes 1200 revolution in 2 hours, calculate the energy constant in revolution per Kwh. (7)

6. (a) Explain how two wattmeter can be used for 3 phase power measurement (7)

(b) Explain with neat sketch how a Maxwell's bridge can be used to
measure inductance (7)

7. (a) What are the different types of characteristics of a transistor? Explain
those characteristics for CB configuration. (7)

(b) Define α , β, γ of a transistor and find the relation between α and β. (7)

8. (a) Explain the working principle of a full wave Bridge rectifier with neat
sketch. (7)
(b) Discuss about PN junction diode and its characteristics.
(7)

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