

INDIAN MARITIME UNIVERSITY
(A Central University, Govt. of India)
End Semester Examinations- Dec 2019/Jan 2020
B.Tech (Marine Engineering)
Semester-I

UG11T3104– Basic Electrical and Electronics Engineering

Date: 17.12.2019
Time: 3 Hrs.

Maximum Marks: 70
Pass Marks: 35

Part – A (compulsory)

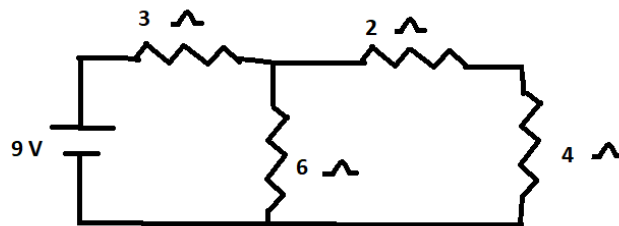
Answer the following (10x2=20 Marks)

1.
 - a) Mention the equations used for star to delta transformation of network reduction.
 - b) What is meant by time constant of a circuit?
 - c) Draw power triangle and mark the various power.
 - d) A Solenoid is wound with a coil of 200 turns. The coil is of length 250 cm and is carrying a current of 2 Amps. Determine the magnetic field strength at the line of the solenoid
 - e) State two reasons for transient disturbances occurring in electrical circuits.
 - f) Name any two insulators used in electrical system of marine application
 - g) Mention four N type/donor impurities
 - h) Why do the semiconductors have negative temperature coefficient of resistance?
 - i) Define Peak Inverse Voltage.
 - j) With respect to junction transistor, what is current gain of a common base configuration?

Part – B

Answer any 5 out of 7 questions (5 x 10= 50 marks)

2. Determine the current through the 4 Ω using Thevenin theorem (10)



- 3.a. A circuit of resistance 10Ω and inductance of 0.1 H in series has a direct voltage of 200 V suddenly applied to it. Find the voltage drop across the inductance at the instant of switching on and at 0.01 second. Find also the flux linkages at these instants. (5)
- b. Explain in detail different parts of lead acid battery. (5)
4. a. Explain mutual induction with neat sketch. (6)
- b. An air cored solenoid has 400 turns, its length 30 cm , has cross section of 10 cm^2 . Calculate self-inductance. (4)
- 5 a. Two number of 200 turns air cored solenoids of 25 cm long have a cross sectional area of 3 cm^2 each. The mutual inductance between them is $0.5\text{ }\mu\text{H}$. Find the self-inductance of the coil and the coefficient of coupling. (6)
- b. A PMMC instrument gives full scale deflection for 50 mV potential difference and 10 mA current. How will you use it to measure a current of 10 A and voltage of 250 V (4)
6. Explain the working of energy meter with neat diagram explaining the function of various parts. (10)
- 7 a. What is a transistor? Explain input and output characteristics of a NPN transistor in a common emitter configuration. (5)
- b. Explain the forward and reverse characteristics of a diode. (5)
- 8 a. How will you use transistor as a switch? (5)
- b. A half-wave rectifier using silicon diode has a secondary emf of 14.14 V (rms) with a resistance of 0.2Ω . The diode has a forward resistance of 0.05Ω and a threshold voltage of 0.7 V . If load resistance is 10Ω , determine,
 - a. Dc load current
 - b. Dc load voltage
 - c. Voltage regulation
 - d. Efficiency (5)