

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)
End Semester Examinations- June-July 2019

Semester – I
B.Tech (Marine Engineering)
Basic Electrical and Electronics Engineering (UG11T3104)

Date: 16-07-2019

Maximum Marks: 100

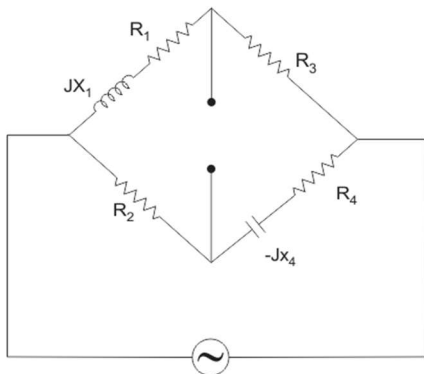
Time: 3 Hrs

Pass Marks: 50

Part-A

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

1. (a) Differentiate between permanent magnet and electromagnet ?
- (b) What is semiconductor and why doping is important for semiconductor?
- (c) What is damping torque in measuring instruments?
- (d) What is form factor and what its value for sinusoidal AC voltage or current?
- (e) Define α and β of a transistor?
- (f) Define linear and nonlinear resistors?
- (g) What are the condition for a 3 phase balanced circuit?
- (h) Find the balance condition of the bridge.

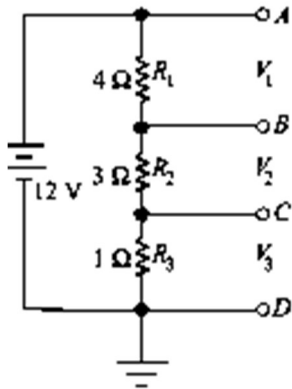


- (i) Define resonance? How many types of resonance is there?
- (j) What is shunt regulator? Draw the circuit diagram of a shunt regulator.

Part B

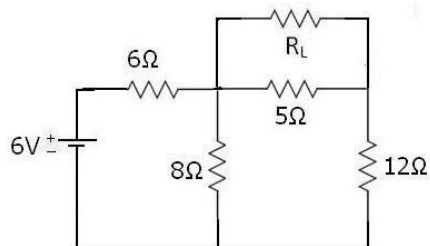
(Answer any five of the following) (5 X 14 = 70 Marks)

2. (a) Find the values of different voltages that can be obtained from a 12-V battery with the help of voltage divider circuit of Fig.



(7)

- (b) Find the value of R_L for the given network below that the power is maximum? And also find the Max Power through load-resistance R_L by using maximum power transfer theorem? (7)



3. (a) Find out the energy stored in a inductor and a capacitor? (7)

- (b) Write down the details construction of lead acid battery? (7)

4. (a) For a star connection derive the expression of i) phase voltage and line voltage ii) phase current and line current. (7)

- (b) A voltage of 120 V at 50 Hz is applied to a resistance, R in series with a capacitance, C . The current drawn is 2 A, and the power loss in the resistance is 100 W. Calculate the R and C and draw the phasor diagram (7)

5. (a) Discuss with neat sketch, the working of a Dynamometer type of a wattmeter. (7)

(b) A moving-coil instrument has a resistance of $10\ \Omega$ and gives full-scale deflection when carrying a current of 50 mA. Show how it can be adopted to measure voltage up to 750 V and currents up to 1000 A. (7)

6. (a) Draw hysteresis loop and explain briefly the various part on it. (7)

(b) A flux of 40 miliweber links with 600 turn coil when a current of 5 ampere is passing through the coil. Calculate

(i) The inductance of the coil.

(ii) The energy stored in the magnetic field.

(iii) The average emf induced if the current is reduced to zero in 0.20 seconds. (2+2+3)

7. (a) A 5.0V stabilised power supply is required to be produced from a 12V DC power supply input source. The maximum power rating P_Z of the zener diode is 2W. Using the zener regulator circuit above calculate:

The maximum current flowing through the zener diode.

The minimum value of the series resistor, R_s

The load current I_L if a load resistor of $1\text{k}\Omega$ is connected across the zener diode

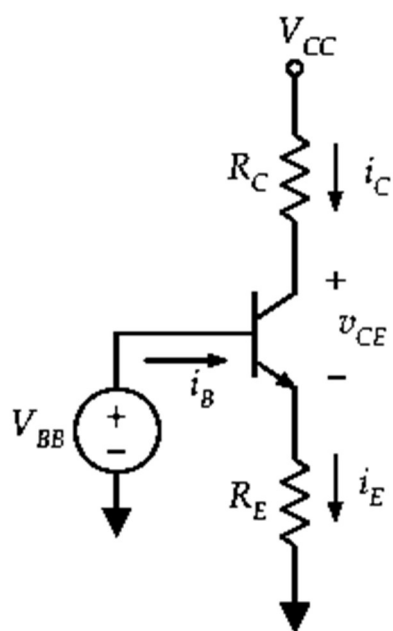
(2+2+3)

(b) What is a PN junction diode? How depletion region formed in a diode? (7)

8. (a) write down the working principle of a transistor . (7)

(b) For the BJT circuit shown below, find i_C , i_B , i_E , and v_{CE} .

In the circuit, $V_{CC} = 17\text{ V}$, $V_{BB} = 1.5\text{ V}$, $R_C = 2\text{ k}\Omega$, $R_E = 1\text{ k}\Omega$, and $\beta_F = 50$.



(7)
