Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 20446

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Second Semester

Electrical and Electronics Engineering

EE 6201 – CIRCUIT THEORY

(Common to Electronics and Communication Engineering/Bio Medical Engineering Electronics and Instrumentation Engineering/ Instrumentation and Control Engineering / Medical Electronics)

(Regulations 2013)

(Also common to PTEE 6201 – Circuit Theory for B.E. (Part-Time) First Semester Electrical and Electronics Engineering/Electronics and Communication Engineering (Regulations – 2014))

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Find 'R' in the circuit shown in Figure. 1

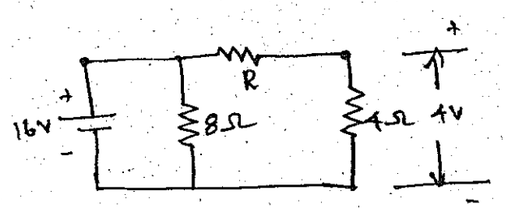


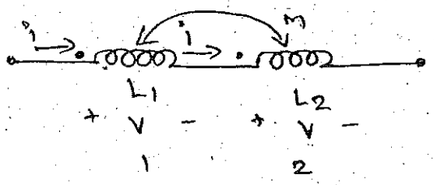
Figure. 1

2. State kirchhoff's laws.

3. The two resistance of 4Ω and 6Ω are connected in parallel. If the total current is 2 A. Find the current through each resistor.

4. A load is connected to a network of the terminals to which load is connected, $R_{th} = 10\Omega$ and $V_{th} = 40\,V$. Calculate the maximum power supplied to the load.

5. Given the circuit what is the equivalent inductance of the system below.



6. Define co-efficient of coupling.

7. Define time constant for RL circuit. Draw the transient current characteristics.

8. What are the parameters commonly used in the analysis of the two port network?

9. Write the distortion power factor equation of the three phase circuits.

10. The power input to a 2000 v, 50 Hz, 3 phase motor is measured by two watt meters which indicate 300 KW and 100 KW respectively. Calculate power factor.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Determine the current in all the resistors of the circuit shown in Figure 11 (a) (i). (9)

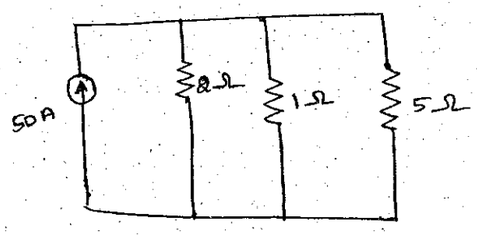


Figure 11 (a) (i)

(ii) State and explain Kirchoff's laws. (7)

Or

(b) Use branch currents in the network shown in Figure 11 (b). To find the current supplied by the 60 V source solve the circuit by the mesh current method. (16)

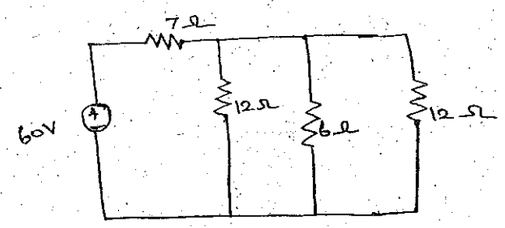


Figure 11 (b)

12. (a) (i) Apply source transformation technique to determine current i_0 in Figure 12.(a) (i). (9)

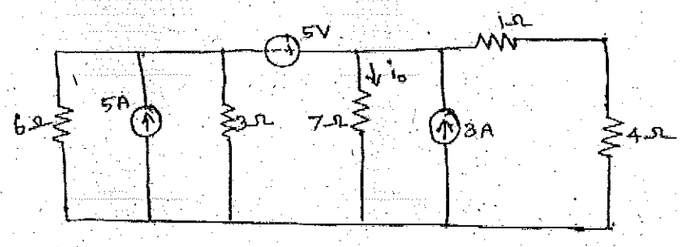


Figure. 12 (a) (i)

(ii) In the circuit of Figure 12. (a) (ii), six resistors are connected to form delta and a star. Find the effective resistance between A and B. (7)

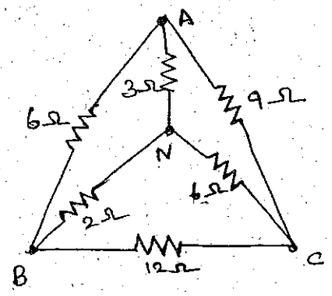


Figure 12 (a) (ii)

Or

(b) (i) Find the power delivered by the 20 V source using superposition theorem for the given circuit in Figure 12 (b) (i). (9)

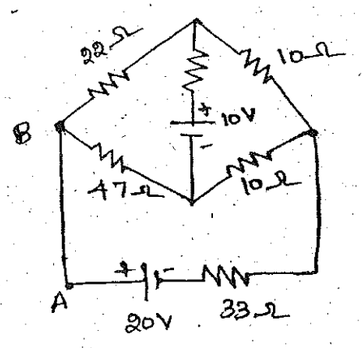


Figure 12 (b) (i)

(ii) Determine the thevenin's equivalent across AB for the given circuit in Figure 12 (b) (ii). (7)

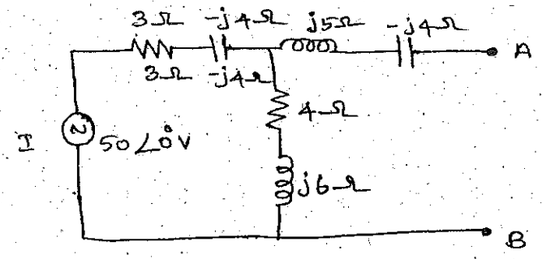


Figure 12 (b) (ii)

13. (a) For the circuit shown in Figure 13 (a), determine the impedance at resonant frequency 10 Hz above resonant frequency and 10 Hz below resonant frequency. (16)

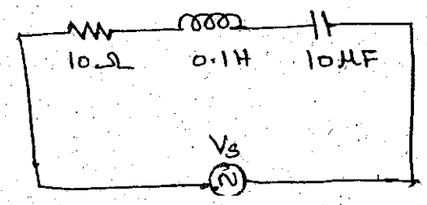


Figure 13 (a)

Or

(b) (i) Discuss the tuned circuit. (8)

(ii) Derive the expression for resonant frequency and bandwidth for a series RLC resonant circuit. (8)

14. (a) A series RL circuit with R = 10Ω and L = 0.1 H is supplied by an input voltage V(t) = 10 sin 100t volts applied at t = 0 as shown in Figure.14 (a). Determine the current I, Voltage across inductor. Derive the necessary expression and plot the respective curves. (16)

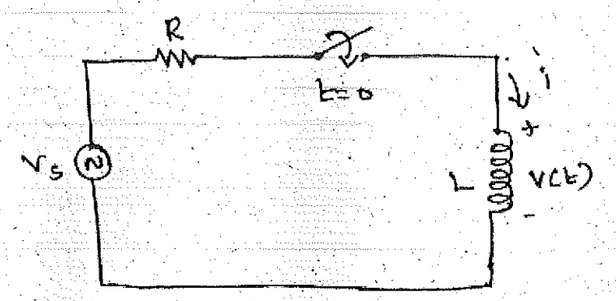


Figure 14 (a)

Or

(b) Find the h-Parameters for the network shown in Figure. 14. (b) (16)

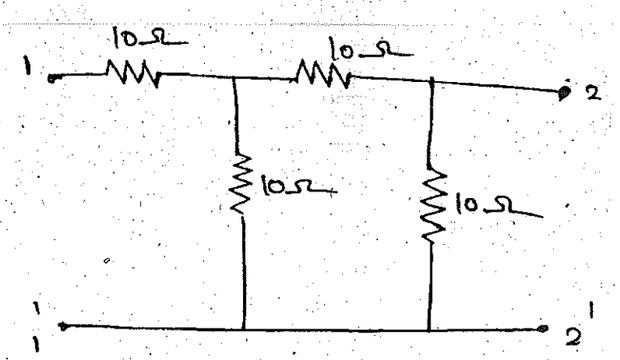


Figure. 14. (b)

15. (a) Discuss in detail the three phase 3-wire circuits with star connected balanced loads. (16)

Or

(b) For the balanced circuit in Figure 15 (b), determine the line currents and voltage across each load impedance. Draw the phasor diagram. (16)

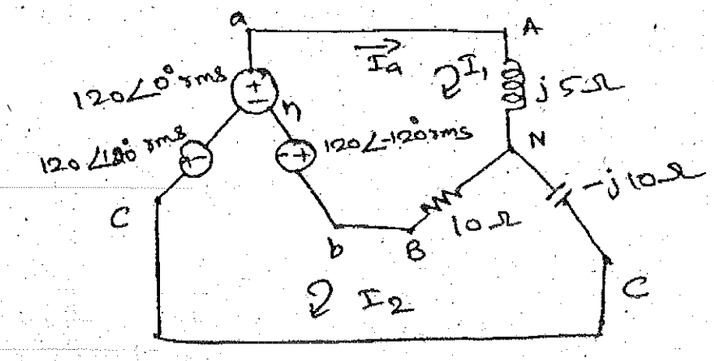


Figure 15 (b)