WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 1st Semester Examination, 2020, held in 2021

ELSACOR01T-ELECTRONICS (CC1)

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

GROUP-A

Answer any *five* questions from the following 2×5 = 10

1. A metallic wire of resistance R is elongated until its length becomes doubled. What will be final resistance of the wire?

2. Calculate the current and resistance of a 100 W, 220 V electric bulb.

3. Why do electrolytic capacitors have a polarity mentioned on their terminals?

4. Explain the "dot condition" with respect to calculation of mutual inductance of two coils.

5. Mention two main characteristics of ideal current source.

6. What is meant by short and open circuits?

7. State any two limitations of Thevenin's theorem.

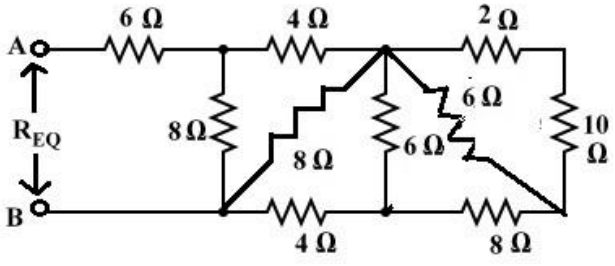
8. Find expression for energy stored by an inductor.

GROUP-B

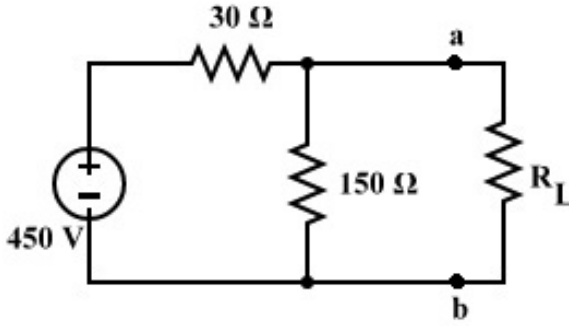
Answer any *six* questions from the following 5×6 = 30

9. Derive conversion formula between a star and a delta network. 5

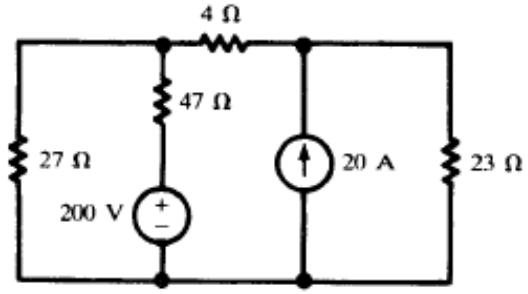
10. Find the equivalent resistance, R_{EQ} for the following resistor combination circuit. 5



11. State maximum power transfer theorem. Calculate the maximum power delivered across R_L of the circuit given. 2+3



12. Find the current in the 23Ω resistor using superposition principle. 5

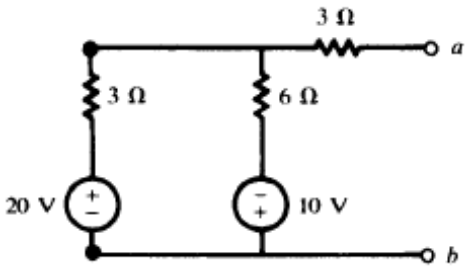


13. Derive expression for current in an RLC circuit under DC excitation. What is the condition for critically damped response? 5

14. "Thevenin's theorem and Norton's theorem are dual to each other." – Explain. What are the advantages of Thevenin's theorem? 3+2

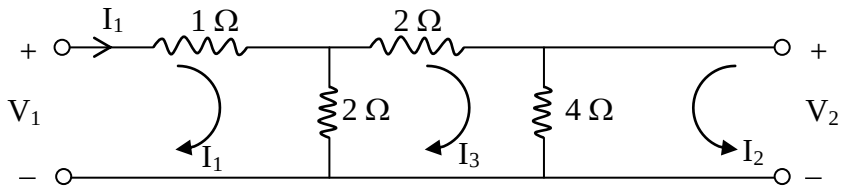
15. What are the various losses associated to a transformer? When the turns ratio of a transformer is 20 and the primary ac voltage is 12 V, what is the value of secondary voltage? 4+1

16. Find the Thevenin and NORTON equivalent of the circuit shown with respect to terminals 'a-b'. 5



17. State and prove reciprocity theorem. 5

18. Find the h-parameter of the given circuit. 5



N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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