

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech Branch: Electrical Engineering and Allied Branches Sem: IV

Subject Code & Name: BTEEC401 Network Theory

Max Marks: 60

Date:- 12/08/2022

Duration:- 3.45 Hr.

Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

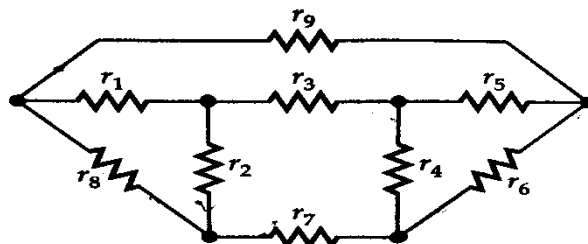
(Level/CO) Marks

Q.1 Solve Any Two of the following.

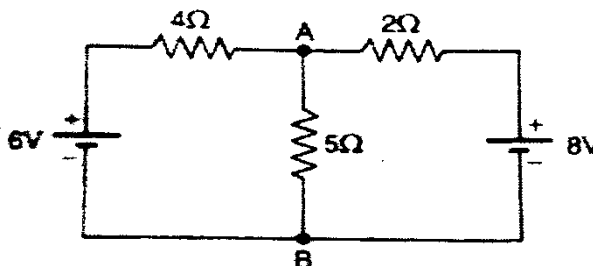
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|--|-------------------------|----------|
| <p>A) Explain the difference between short circuit (SC) and open circuit (OC) with an example.</p> | Understand | 6 |
| <p>B) Explain the following terms with suitable example</p> <ol style="list-style-type: none"> 1. Linear and non linear elements 2. Unilateral and bilateral elements | Understand | 6 |
| <p>C) Explain two types of energy source. Distinguish between ideal and non-ideal sources.</p> | Understand/
Analysis | 6 |

Q.2 Solve Any Two of the following.

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|---|-------------------|----------|
| <p>A) State and Explain KVL and KCL with example</p> | Knowledge | 6 |
| <p>B) Following figure represents a resistive network. Draw its graph. Select a suitable tree and obtain the tie-set matrix.</p> | Comprehen
sion | 6 |



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| <p>C) State the Thevenin's theorem and find current through branch AB using Thevenin's theorem. Refer following figure.</p> | Comprehen
sion /
Evaluation | 6 |
|--|-----------------------------------|----------|

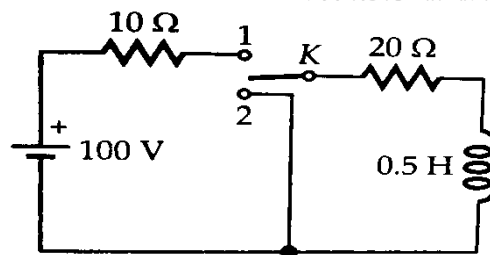


Q.3 Solve Any Two of the following.

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| A) Explain first order and second order RC and RL circuit. | Understand | 6 |
| B) Explain various properties of a capacitor. | Understand | 6 |
| C) An inductor with initial current I_0 is connected to a resistor of R ohms at $t = 0$. Derive the expression for the current through inductor and voltage across inductor at any time $t > 0$. | Evaluation | 6 |

Q.4 Solve Any Two of the following.

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| A) Derive the symmetry and reciprocity condition of z-parameters. | Evaluation | 6 |
| B) Explain Z-Parameters in terms of Y-parameter & h-parameters. | Understand | 6 |
| C) In following figure the switch K is kept first at position 1 and steady state condition is reached. At $t=0$, the switch is moved to position 2. Find the current in both the cases. | Evaluation | 6 |



Q. 5 Solve Any Two of the following.

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| A) Derive the expression for resonant frequency f_r of a series resonant circuit. | Synthesis | 6 |
| B) Derive the expression for Q factor of parallel resonating circuit. | Synthesis | 6 |
| C) Design a constant K LPF with $f_c = 1\text{KHz}$ and $R_O = 600 \Omega$ At what frequency α will be 10 Db? | Synthesis | 6 |

α will be 10 Db?

To calculate (i) L, C (filter Elements)

(ii) Frequency at which $\alpha = 10\text{dB}$

*** End ***