GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-III(NEW) EXAMINATION - SUMMER 2023

Subject Code:3131103

Subject Name:Network Theory

Time:02:30 PM TO 05:00 PM

Total Marks:70

Date:01-08-2023

Instructions:

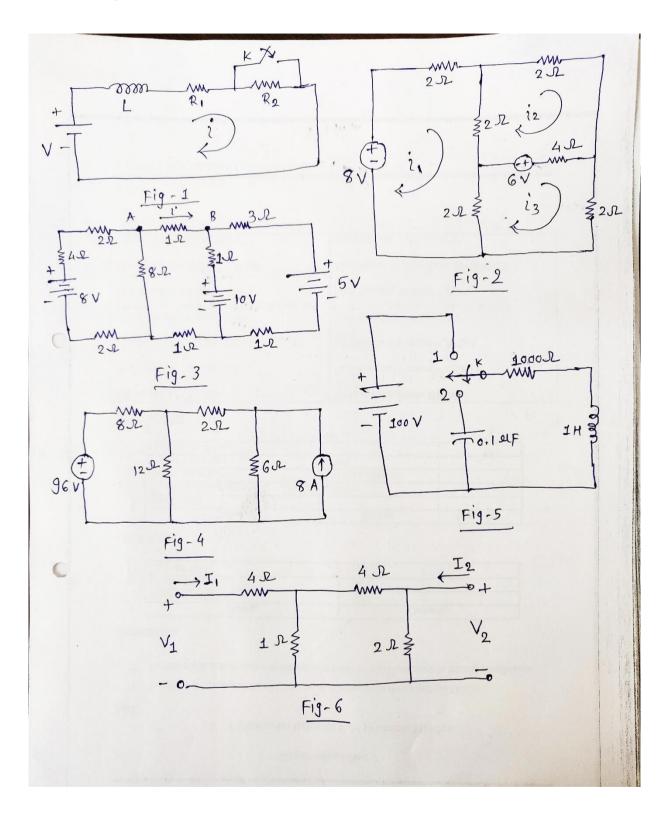
- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- 4. Simple and non-programmable scientific calculators are allowed.

MARKS

bDefinetion04(b)Briefly describe active, passive, lumped and distributed elements.04(c)In the network of Fig-1, the switch k is closed at t=0 and the circuit was in steady state before. Determine particular solution of current i.07(c)In the network of Fig-1, the switch k is closed at t=0 and the circuit was in steady state before. Determine particular solution of current i.03(b)Define: Tree, Connected Graph, Co-tree, Sub-graph.04(c)Determine current through 4 Ω resistor using mesh analysis for network of Fig-2.07(c)State and explain maximum power transfer theorem with necessary derivation.07(c)State and explain maximum power transfer theorem with necessary derivation.03(d)Discuss rules for source transformation.04(e)For the network of Fig-3, obtain current through 1 Ω resistor using Thevenin's theorem.07(c)Define time constant and state its importance in circuit analysis. (f)03(d)State and explain Norton's theorem with an example. (f)04(e)Determine voltage across 6Ω resistor of Fig-4 using node analysis.07(f)Give statements for Reciprocity Theorem and Superposition Theorem. (f)07(f)Find values of $i, \frac{di}{dt}, \frac{d^2i}{dt^2}$ at t=0+. for the network of Fig-5, if switch k is changed from position 1 to 2 at t=0. OR03(g)Q.4(a)Derive ABCD parameters in terms of z-parameters. (f)04(g)Derive relationship between incidence matrix, fundamental tie-set matrix	Q.1	(a)	Explain Ideal and Practical Current and Voltage sources with their characteristics and differentiate them with respect to ideality and practice.	03
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Q.5 (a) Define: Incident Matrix, cut-set, graph.

- (**b**) Briefly explain PRF.
- (c) Derive the condition for the network to be symmetrical for g- 07 parameters.



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