Enrollment No: \_\_\_\_

Exam Seat No:\_\_\_\_\_

## C.U.SHAH UNIVERSITY Winter Examination-2015

Subject Name: Network Analysis

#### Subject Code: 4TE03NAS1

## Branch: B.Tech (EC)

# Semester: 3 Date: 5/12/2015 Time: 2:30 To 5:30 Marks :70 Instructions: Instruction (Construction (Constrution (Constrution (Construction (Constrution (Construction (Cons

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

## Q-1 Attempt the following questions

- a) What is Reciprocal Networks?
- **b**) What is Symmetrical Networks?
- c) Define Unilateral elements.
- **d**) Define Bilateral elements.
- e) Define Lumped elements.
- **f**) Define Distributed elements.
- g) What is Poles of network function?
- **h**) What is Zeros of network function?
- i) Define Tree.
- **j**) Define Tie-set matrix.
- **k**) Define Basic Cut-set matrix.
- I) Define Loop matrix.
- **m**) Define Incidence matrix.
- **n**) Define Directed Graph.

#### Attempt any four questions from Q-2 to Q-8

## Q-2 Attempt all questions

- (a) Differentiate between current source and voltage source. Draw and explain the characteristics of ideal and practical sources.
- (b) Explain Star delta transformation in detail.

## Q-3 Attempt all questions

- (a) Derive the Relationship between Bandwidth of series resonant circuit and its quality factor-Q.
- (b) Explain parallel resonance circuit in detail.

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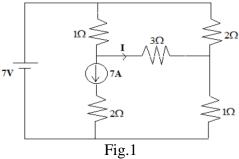
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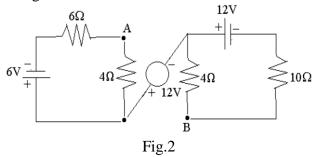
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#### Q-4 Attempt all questions

(a) Calculate current 'I' in circuit shown in Fig.1 using Loop analysis.

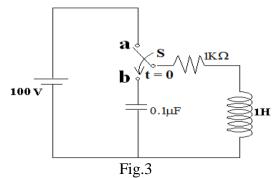


(b) Using any method, obtain the voltage  $V_{AB}$  across terminals A and B in the network, shown in Fig.2.



#### Q-5 Attempt all questions

(a) For the circuit as shown in Fig.3 switch S is changed from position 'a' to 'b' at t = 0. Find values of i, di/dt, and di<sup>2</sup>/dt at t = 0.



(b) Define and Prove the Initial value and Final value Theorem.

#### Q-6 Attempt all questions

(a) State Thevenin's Theorem and find the current flowing through the load resistor  $22\Omega$  in the circuit shown in Fig.4 by applying Thevenin's theorem.

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(14)

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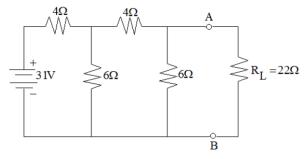


Fig.4

(14)

(14)

(b) State and prove maximum power transfer theorem.

## Q-7 Attempt all questions

- (a) Derive an expression for the current i(t) in a series R-C circuit when it is excited by an impulse input with zero initial conditions.
- (b) Find the Laplace transform of (i) Unit Step Function (ii) Exponential Function.

#### Q-8 Attempt all questions

- (a) Derive an expression for the transmission parameters of a two port network.
- (b) Derive the Relationship between Z and Y parameter.



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