Hall Ticket Number:

Code No. : 13412 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (ECE: CBCS) III-Semester Supplementary Examinations, June-2019

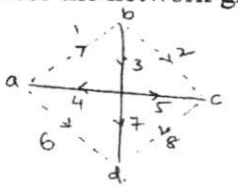
Networks Analysis

Time: **3** hours Max. Marks: **60**

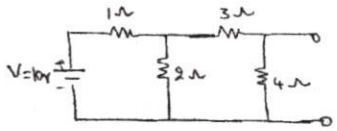
*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2=20 Marks)

1. State and explain Kirchhoff's Laws
2. Obtain fundamental cut-set matrix for the network graph shown in figure



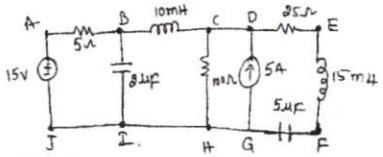
3. State Tellegen's theorem.
4. Obtain the Thevenin's equivalent circuit for the network shown in figure



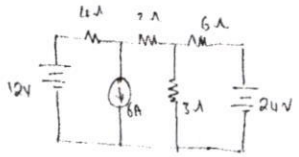
5. Differentiate between Zero Input Response (ZIR) and Zero State Response.
6. How to evaluate the initial conditions of a circuit?
7. Define Z-parameters of the network
8. Draw the equivalent circuit for the h-parameters.
9. Check whether the given polynomial P(S)=$S^4 + S^3 + 2S^2 + 4S + 1$ is Hurwitz or not
10. Define Bandwidth of a resonant circuit and draw the frequency response of an RLC series circuit.

Part-B (5 ×8=40 Marks)

11. a) For the electrical network shown in figure, draw its topological graph and write its incidence matrix, tie-set matrix , link current transformation equation and branch current [4]

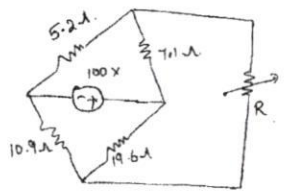


b) Use Source transformation to find Io in the circuit shown in figure [4]



12. a) Explain the step by step procedure for obtaining the Thevenin's equivalent of a given circuit with an example. [3]

b) Find the value of R that receive maximum power. Determine the maximum power. [5]



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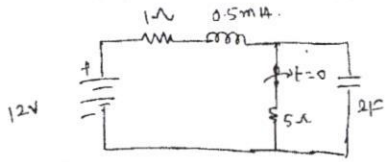
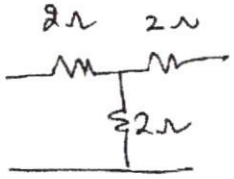
13. a) The switch shown in the following circuit has been closed for a very long time. It opens at t=0. Find $V_C(t)$ for $t>0$ using differential equation approach [5]



b) Differentiate between transient and steady state analysis. [3]

14. a) Find the transmission parameters for the network shown below [4]



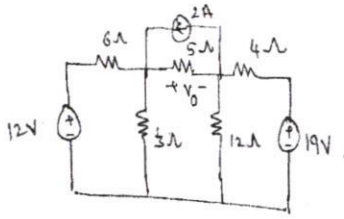
b) Derive the relation between Z-parameters and h-parameters. [4]

15. a) Realize the function $Z(S) = \frac{S(S^2+4)}{2(S^2+1)(S^2+9)}$ in Foster form-I LC network. [4]

b) Realize the function $Z_{RC}(S) = \frac{S^2+4S+1}{(4S^2+5S+1)}$ in Cauer –II form. [4]

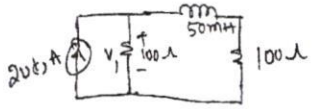
16. a) Distinguish between mesh and Nodal analysis. [3]

b) By Super-position theorem calculate current I in the following circuit. [5]



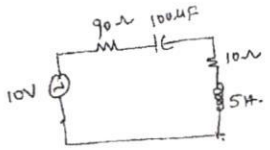
17. Answer any ***two*** of the following:

a) For the circuit shown in figure, find the values of V_1 at t equal to (a) O^- (b)O^+ (c)∞ (d)0.2msec [4]



b) Show that when two 2-port networks N1 and N2 are connected in parallel, the equivalent Y-parameters of the combined network is the sum of Y-parameters of each individual 2-port network. [4]

c) For the circuit shown in figure, determine the Q factor value at resonance and bandwidth of the circuit [4]



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