GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **IN252U - Network Theory**

Generated At : **19-04-2022 15:06:52**

Maximum Marks : **60**   Duration : **3 Hrs**

[Edit] [Print] [View Answer Key] [Close] **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. *All questions are compulsory.*
2. *Illustrate your answer with suitable figures/sketches wherever necessary.*
3. *Assume suitable additional data; if required.*
4. *Use of logarithmic table, drawing instruments and non programmable calculators is allowed.*
5. *Figures to the right indicate full marks.*

1) A) Define Kirchoff's laws and find the node voltages in the circuit shown in Fig. 1   [6]
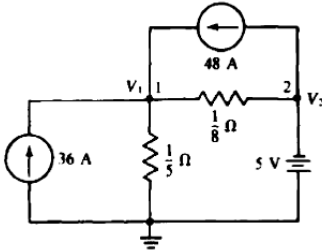

Fig. 1

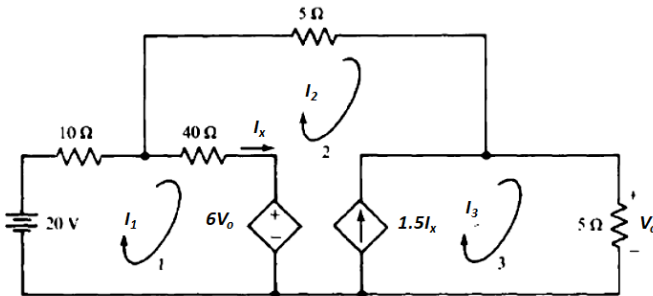B) Explain Dependent and Independent sources.   [6]
Use mesh analysis in finding V_o in the circuit.

Fig. 2

2)   Attempt any two

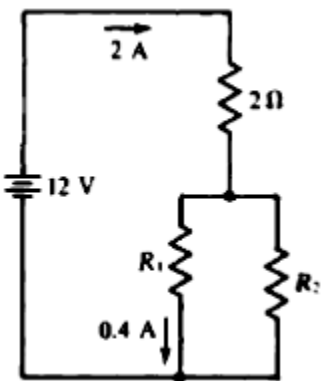A) What is the current divider rule?. Find R_1 and R_2 for the circuit shown in fig. 3   [6]

Fig. 3

B) Use a ∇-to-$\ddot{Y}$ transformation in finding the currents I_1, I_2 and I_3 for the circuit shown in Fig. 4 [6]
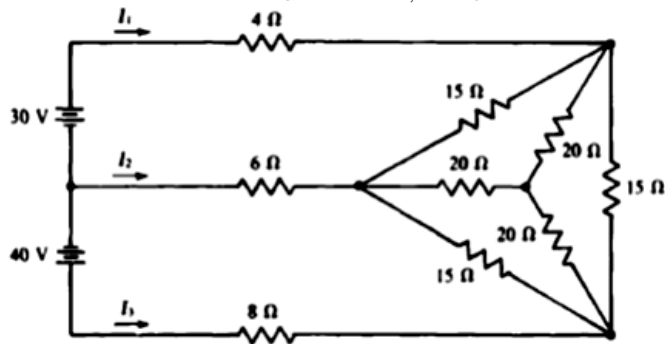

Fig. 4

C) Explain Thevenin's and Norton's Theorem with steps to find the equivalent circuit. [6]

3) Attempt any two

A) Define and explain the Maximum Power Transfer Theorem for AC Networks. [6]

B) Consider an electric circuit shown in Figure 5.Determine : (i) the current and power consumed in each branch.(ii) the supply current and power factor. [6]
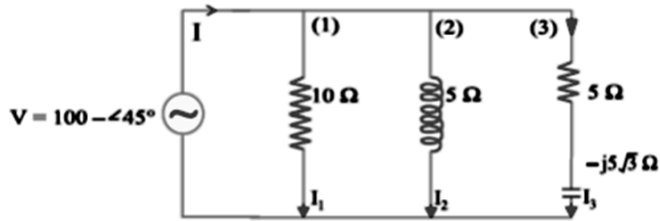

Fig. 5.

C) Find Z_{Th} and V_{Th} for the Thevenin equivalent of the circuit shown in Fig. 6 [6]
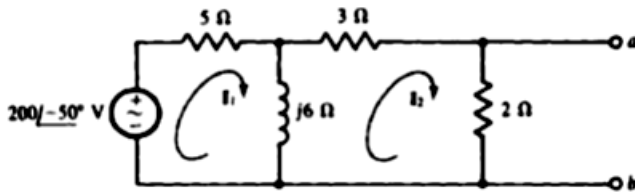

Fig. 6.

4) A) [6]

Given the circuit of Fig. 7, write the loop equations and solve for the loop currents. Determine the voltage, V.
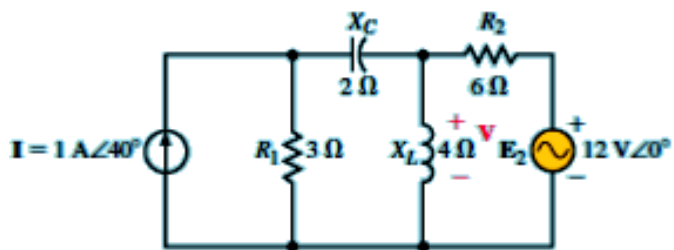

Fig. 7.

B) What do you mean by the impedance of series RLC circuit. Determine the impedance Z which must be within the indicated block of Fig. 8, if the total impedance of the network is 13 Ω $\angle$22.62°. [6]
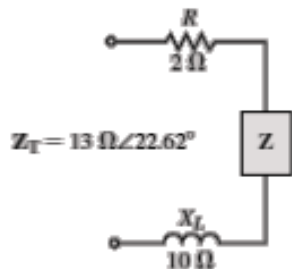

Fig. 8

5) Attempt any two

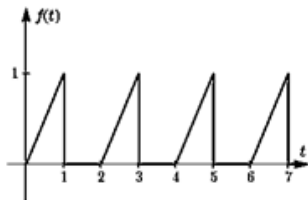A) Define Admittance parameters (y-parameters) and Hybrid parameters for the two-port network. [6]

B) What do you mean by Poles and zeros of network functions? Describe Time domain behavior from pole and zero plot. [6]

C) Find the Laplace transforms of the periodic functions shown below in Fig. 9

[6]

Graph of periodic unit ramp function.

Fig. 9