Code No: R2021023 **R20** SET - 1

II B. Tech I Semester Regular Examinations, Feb/March - 2022
ELECTRICAL CIRCUIT ANALYSIS - II
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions each Question from each unit
All Questions carry **Equal** Marks
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1 a) A 220V, 3- ϕ voltage is applied to a balanced delta-connected 3- φ load of phase impedance (15 + j20) Ω (i) Find the phasor current in each line. (ii) What is the power consumed per phase? (iii) What is the phasor sum of the three line currents? Why does it have this value? [7M]

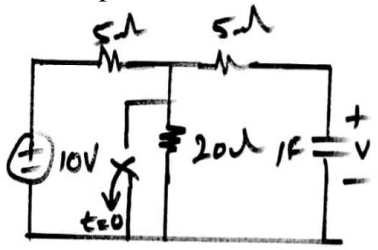
b) Derive the expression for measurement of three phase power using two wattmeter methods. [7M]

Or

2 a) Three 100 Ω non-inductive resistances are connected in (i) star (ii) delta across a 400V, 50Hz, 3-ϕ mains. Calculate the power taken from the supply system in each case. In the event of one of the three resistances getting open-circuited, what would be the value of total power taken from the mains in each of the two cases? [7M]

b) Three phase 400-V, 50 Hz, a.c. supply is feeding a three-phase delta connected load with each phase having a resistance of 25 Ω, an inductance of 0.15 mH, and a capacitor of 120 μ/F in series. Determine the line current, volt-amp, active power and reactive volt-amp. [7M]

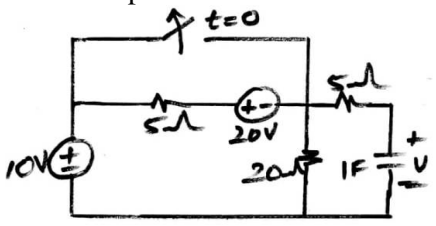
3 a) Determine the voltage across the capacitor for the circuit shown in the figure below. [7M]



b) Define time constant and derive the expression for the voltage across a capacitor in RC series circuit when excited with a step input. [7M]

Or

4 a) Determine the voltage across the capacitor for the circuit shown belowi [7M]



b) Derive an expression for voltage across R in an R-L-C series circuit when the circuit is excited with step voltage. [7M].

5 Derive the expression for transient response of RC circuit using Laplace transform method. [14M]

Or

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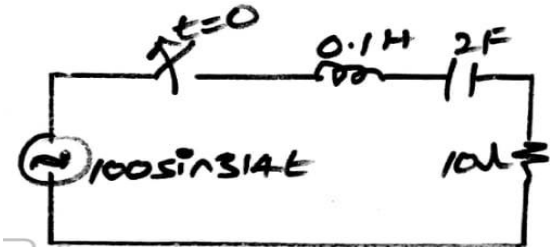
6 a) Derive the relationship for the current in the series RL circuit with sinusoidal excitation. [7M]

b) Find the current in the circuit shown in below, for t>0. At t=0- the network was un-energized in differential method. [7M]

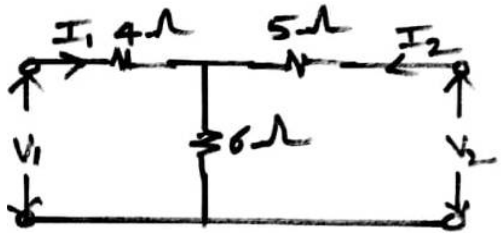


7 a) Derive the expression for the ABCD parameters when two networks are cascaded. [7M]

b) Derive the condition for symmetry and reciprocity in terms of z and y parameters. [7M]

Or

8 a) Obtain the h-parameters of the network shown in below figure. [7M]



b) Express the z parameter in terms of h parameters. [7M]

9 a) Deign a band pass T-section filter with cut off frequencies of 5 kHz and 10 kHz operating into a load of 500 Ω. [7M]

b) Sketch the characteristics of all the filters. Mention the necessary filter parameters. [7M]

Or

10 a) Define propagation constant and attenuation constant. Also Design a band stop T- section filter with cut off frequencies 10 kHz and 20 kHz. The design impedance is 600 Ω. [7M]

b) Design a m-derived π-section high pass filter having a cut off frequency of 2 kHz. Take design impedance of 500Ω and frequency f∞ = 2.1 kHz. Find the attenuation at 2.05 kHz and 2.5 kHz. [7M]