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

**II B. Tech I Semester Supplementary Examinations, July - 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 3- ϕ, 434-V, 50-Hz, supply is connected to a 3- ϕ, Y-connected induction motor and synchronous motor. Impedance of each phase of induction motor is (1.25 + j2.17) Ω. The 3-ϕ synchronous motor is over-excited and it draws a current of 120 A at 0.87 leading p.f. Two wattmeter's are connected in usual manner to measure power drawn by the two motors. Calculate (i) reading on each wattmeter (ii) combined power factor. [7M]

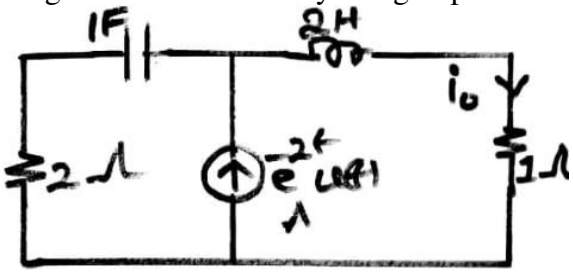
b) Derive the expression for measurement of power in a 3- ϕ circuit using two-watt meter method with necessary phasor diagram. [7M]

Or

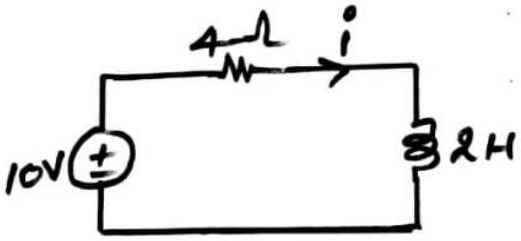
2 a) Each phase of a star-connected load consists of a non-reactive resistance of 100Ω in parallel with a capacitance of 31.8 μF. Calculate the line current, the power absorbed, the total kVA and the power factor when connected to a 416V, 3-phase, 50-Hz supply. [7M]

b) A star-connected alternator supplies a delta connected load. The impedance of the load branch is (8 + j6) ohm/phase. The line voltage is 230 V. Determine (a) current in the load branch (b) power consumed by the load (c) power factor of load (d) reactive power of the load. [7M]

3 a) Determine $i_o(t)$ in the given circuit below by using Laplace transform. [7M]




b) Determine the current $i$ for t >= 0 if the initial current $i(0) = 1$ for the circuit shown below by Laplace transform. [7M]




Or



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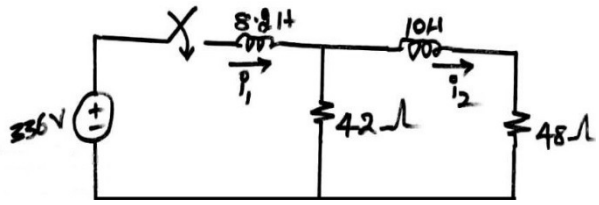
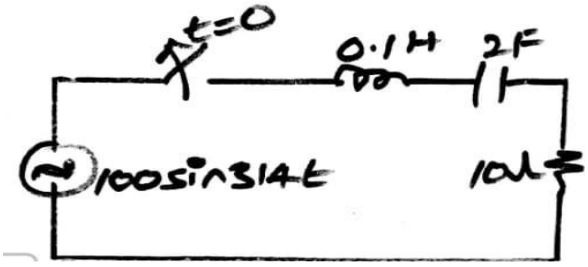
4 a) Obtain the expression for $i_1$ and $i_2$ in the circuit shown below, when dc voltage source is applied suddenly. Assume that the initial energy stored in the circuit is zero. [7M]




b) Obtain the expression for current in the series R-C circuit is excited by step input in Laplace transform approach. [7M]

5 a) Derive the relationship for the current in the series R-L circuit with sinusoidal excitation. [7M]

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

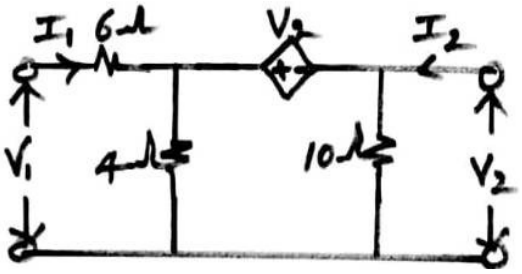



Or

6 a) Derive the expression for transient response of RC circuit using Laplace transform method. [7M]

b) Derive the expression for transient response of RLC circuit using Laplace transform method. [7M]

7 a) Find Y and Z parameters of the network shown in below figure. [7M]

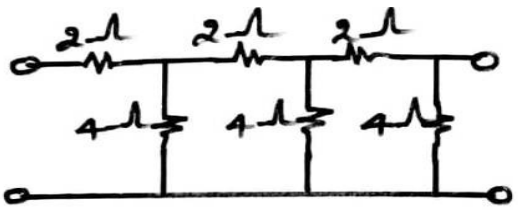



b) Derive the inter relation between ABCD parameters and y-parameters. [7M]

Or

8 a) Derive the Z parameters in terms of ABCD parameters. [7M]

b) Find the ABCD parameters of the network shown in below figure [7M]




9 a) A low pass π section filter consists of an inductance of 25mH in the series arm and two capacitors of 0.2F in the shunt arms. Calculate the cut off frequency, design impedance, attenuation at 5 kHz and phase shift at 2 kHz. Also find the characteristic impedance at 2 kHz. [7M]

b) Design a m-derived T-section low pass filter having a cut-off frequency of 2kHz, design impedance 600 Ω and frequency of infinite attenuation at 2050 Hz. [7M]

Or

10 a) Design a composite High pass T section filter to operate into a load impedance of 600 Ω, cut off frequency 1.5 kHz and infinite attenuation at 1.4 kHz. [7M]

b) Sketch the various m-derived filter configurations with necessary parameters. [7M]