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KAMALA INSTITUTE OF TECHNOLOGY& SCIENCE, SINGAPUR
23EE28PC104

I.B. Tech. I Semester Regular/Supplementary Examinations, Jan/Feb-2025

ELECTRICAL CIRCUIT ANALYSIS-I

(Electrical and Electronics Engineering)

Time: 3 Hours

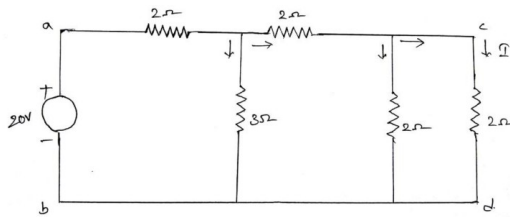
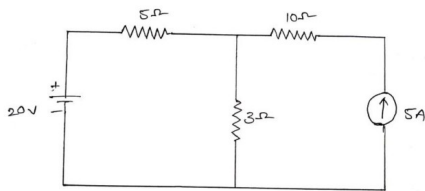
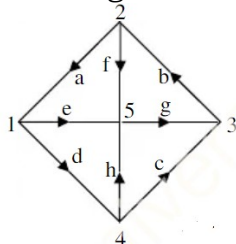
Max. Marks: 60

Note: Question paper consists of Part-A & Part-B.

- i) **Part-A** for 10M, ii) **Part-B** for 50marks
- Part A** is compulsory, consists of 10 sub questions from all units carrying equal marks.
 - Part-B** consists of **10 questions** (numbered from 2 to 11) carrying **10marks** each. From each unit there are 2 questions and the students should answer one of them. Hence the student should answer **5 questions** from **Part-B**.

PART-A (10Marks)			
Q. No	Questions	Marks	BTL
1.a)	Write the Volt-ampere relations of R,L,C parameters.	1M	1
1.b)	Distinguish between passive and active components	1M	1
1.c)	Define form factor and peak factor of an alternating quantity	1M	1
1.d)	Define resonance and bandwidth	1M	1
1.e)	State Maximum power transfer theorem	1M	1
1.f)	State Compensation theorem	1M	1
1.g)	What is a balanced three phase circuit analysis?	1M	1
1.h)	What are the advantages of three-phase system?	1M	1
1.i)	Why the coefficient of coupling in a magnetic circuit is not more than unity.	1M	1
1.j)	Define graph and node.	1M	1

PART-B (50Marks)			
Q.No.	Questions	Marks	BTL
2. a)	State and explain KVL and KCL with the help of an example.	5M	2
b)	Two resistances of 50 Ω and 40 Ω respectively are connected in parallel. A third resistance of 10 Ω is connected in series with the combination and a DC supply of 220V is applied to the circuit. calculate the current in each resistance ?	5M	3
OR			
3. a)	Obtain the expressions for star-delta and delta-star equivalence of resistive network.	10M	3
4. a)	Obtain the expression for resonant frequency, bandwidth and Q-factor for Series R-L-C circuit	10M	3

OR			
5. a)	Determine the average value, RMS value, Form factor and peak factor of a pure sinusoidal Waveform?	10M	3
6. a)	Derive the condition for the maximum power to be transferred from the source to the load.	5M	3
b)	Verify Reciprocity Theorem for the network shown in figure 1	5M	3
 Figure:1			
OR			
7. a)	Find the current passing through 3Ω Resistor for the circuit shown below in Fig 2 by using Superposition Theorem?	10M	3
 Figure:2			
8. a)	Derive the relationship between phase quantities and line quantities in a 3 -phase balanced star connected system and draw phasor diagram showing voltages and currents.	10M	3
OR			
9. a)	The two-watt meter readings in a 3 - phase power measurement are 800 W and 600 W. The latter reading is being obtained after the reversal of current coil. Calculate the total power and power factor of the load	5M	3
b)	Three identical impedances of $(5+j4)$ ohm are connected in delta. Find an equivalent star network such that the line current is the same when connected to the same supply.	5M	3
10.a)	Explain Self Inductance, Mutual Inductance and Co-efficient of coupling in detail? Give the relation between L1, L2, K & M?	10M	2
OR			
11.a)	For the network graph shown in figure 3,draw all possible trees. For any one of these trees,prepare a cut-set schedule and obtain the relation between tree- brach voltages and brach voltages.	10M	3
 Figure: 3			