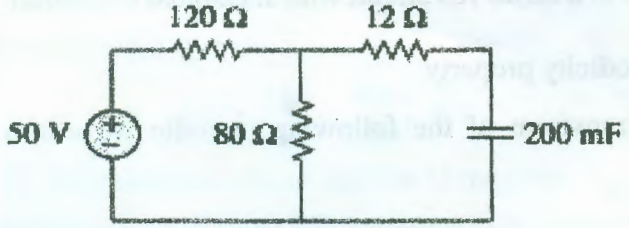
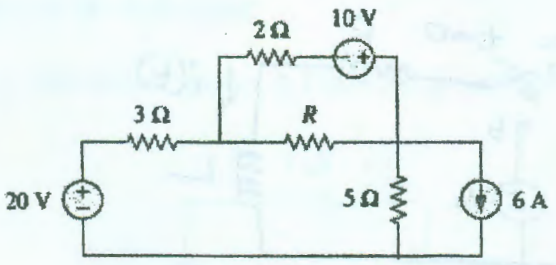
Hall Ticket Number:

Code No. :14313

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. (EEE: CBCS) IV-Semester Main Examinations, May-2019
Electrical Circuits - II

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

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

Q.No.	Stem of the question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	Draw the Series equivalent circuit of capacitor under initial conditions.	2	1	1	1,2
2.	 Fig. 1 Obtain the time constant of the circuit shown in Fig.1.	2	3	1	1,2
3.	Explain final value theorem and its limitation.	2	2	1	1,2
4.	Explain any two advantages of Laplace Transforms over Classical methods.	2	2	2	1,2
5.	When the input to a system is unit step function, the response is 10 sin 2t u(t). Obtain the transfer function of the system.	2	1	4	1,2
6.	Define Time constant of series R-L circuit.	2	1	2	1,2
7.	If a waveform contains rotational odd symmetry, Write the type of terms does the Fourier Series contain.	2	1	4	1,2
8.	Draw the dual of the given network shown in Fig.2  Fig.2	2	4	4	1,2
9.	Explain the condition for reciprocity in terms of ABCD parameters.	2	2	5	1,2,5
10.	Mention which parameters do you prefer when two 2-port networks are connected in series-parallel to find the overall parameters of the combined network? Explain the procedure to obtain them.	2	2	5	1,2

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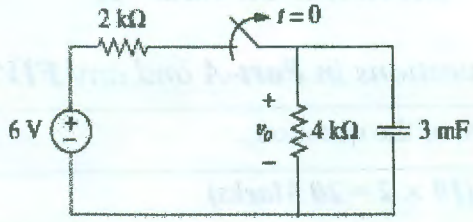
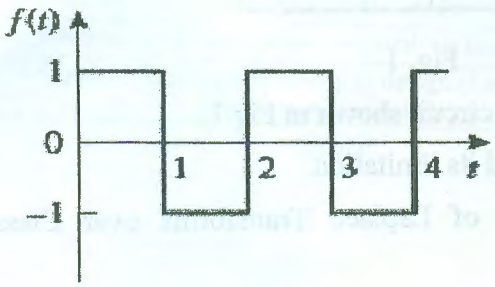
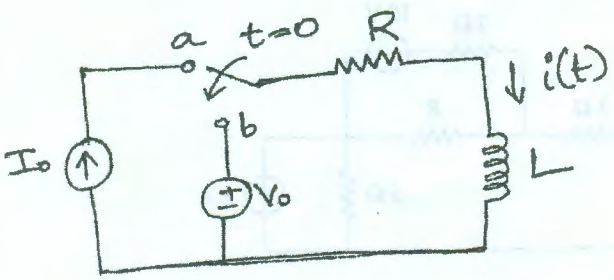
	Part-B (5 × 8 = 40 Marks)				
11. a)	Find $v_0(t)$ in the circuit shown in Fig. 3 when the switch opens at t=0.	4	4	1	1,.
	 Fig.3				
b)	Obtain complete response of a series RL circuit with sinusoidal excitation.	4	2	1	1,2
12. a)	State and Prove time periodicity property.	4	2	2	1,2
b)	Determine the Laplace transform of the following periodic waveform shown in Fig.4.	4	5	2	1,2
	 Fig.4				
13. a)	Draw the pole zero diagram for the given network function I(s) and hence obtain i(t). $I(s) = \frac{20s}{(s+5)(s+2)}$	4	4	3	1,2,5
b)	In the given circuit shown in Fig.5, the switch moves from position a to position b at t=0. Find i(t) for t > 0.	4	4	3	1,2,5
	 Fig.5				
14. a)	Obtain the Fourier series for half-wave rectifier output.	4	2	4	1,2,3

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	b) Obtain the basic cut-set matrix for the given oriented graph shown in Fig. 6, taking 1,2,3,4 as tree branches. Write the KCL network equations from the matrix.	4	2	4	1,2,5

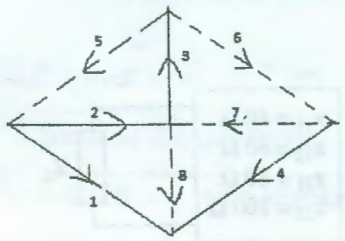

Fig. 6

15. a)	For the circuit shown in Fig.7. $[Z] = \begin{bmatrix} 40 & 60 \\ 80 & 120 \end{bmatrix}\ \Omega$	6	4	5	1,2,5
	a) Find Z_L for maximum power transfer to the load.				
	b) Calculate the maximum power delivered to the load				

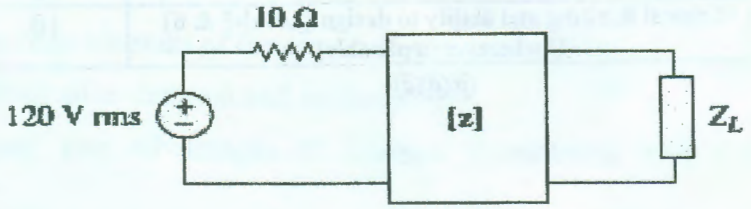

Fig. 7.

	b) Derive the relationship between Z and ABCD parameters.	2	2	5	1,2
16. a)	Explain initial and final conditions of inductor and capacitor.	4	2	1	1
	b) Find the inverse laplace transform of $F(s)=\frac{10s}{(s^2+1)(s^2+4)}$	4	2	2	1,2
17.	**Answer any *two* of the following:**				
	a) Determine i(t) in the circuit shown in Fig.8 using Laplace Transforms.	4	4	3	1,2

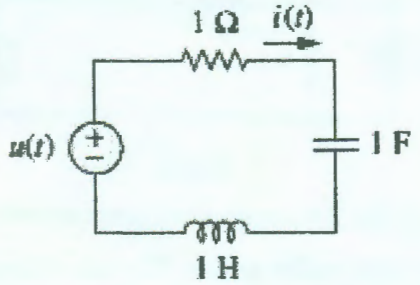

Fig. 8

b) Explain Symmetry conditions in detail.	4	1	4	1,2
c) Determine the average power delivered to Z_L=5+j4 in the network shown in Fig.9.	4	5	5	1,2,5

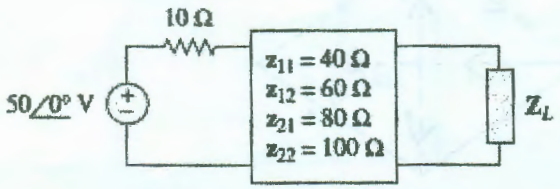

Fig. 9

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	55
2	Knowledge on application and analysis (Level-3 & 4)	35
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	10

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