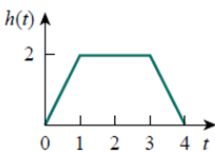**Aliah University**

Electrical Engineering Department

B.Tech 3rd Sem Online Examination 2022 (Regular + Supplementary)

Subject with code: Electrical Network Analysis (EENUGPC01)(Reg+Sup)

Electrical Network Analysis (EE 201) (Sup)

Signals & Networks (EE 201) (Sup)

The figures in the margin indicate full marks.

All parts of a question should be answered at one place.

Answer all questions from Group A and any four questions from Group B:
(Marks: 20+15x4=80)

Qu. No.	Group A (4+4+12=20)	Marks
1.a.	Find the Laplace transform of h(t) in Fig.1	**4**

Fig.1

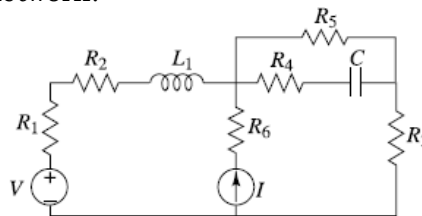|		
1.b.	State Dirichlet's conditions for a function to be expanded as a Fourier series.	**4**
1.c.	For the circuit shown in Fig. 2., (i) draw the oriented graph and write the (ii) incidence matrix, (iii) f-cutset matrix. (iv) How many trees are possible for the graph of the network?	**2+3+3+4**

Fig. 2.

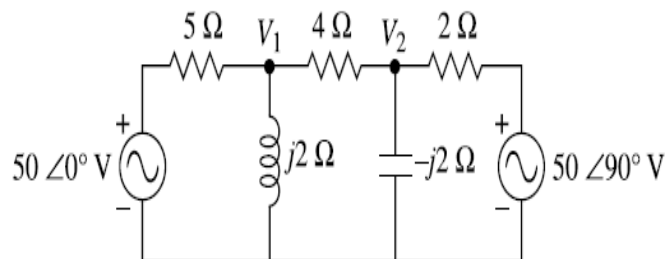| Qu. No.	Group-B(15x4=60)	Marks
2.	What is super node in electrical circuit? In the network shown in Fig. 3., find the node voltages V_1 and V_2 and current in the branch with the resistor 4Ω.	**2+13**

Fig. 3.

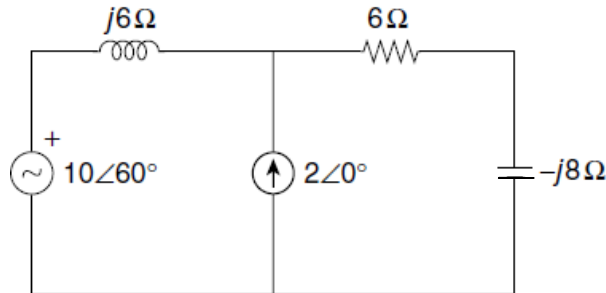| Qu. No.		Marks
3. a.	Write differences between independent and dependent voltage/current source.	**4**
3.b.	Find the current through 6Ω resistor shown in Fig. 4. using the mesh analysis. Here, voltage source is $10∠60^0V$ and current source is $2∠0^0A$.	**11**

Fig. 4.

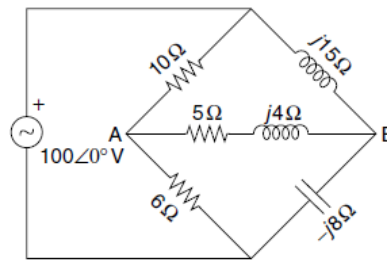| **4.** | State Thevenin's Theorem. Find the current in the (5+j4) Ω impedance connected between A and B in the circuit shown in Fig. 5. using Thevenin's theorem. | **3+12** |

Fig. 5.

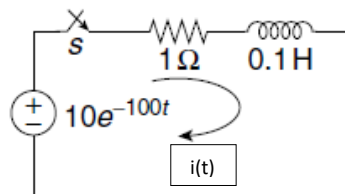| **5. a.** | Evaluate Laplace Transform of $sin^3(t)$ | **5** |
| **5. b.** | A series R–L circuit shown in Fig. 6. experiences an exponential voltage $v = 10e^{-100t}V$ after closing the switch at $t = 0$. Find the expression for current i(t) using Laplace transform. Assume zero initial inductor current before switching. | **10** |

Fig. 6.

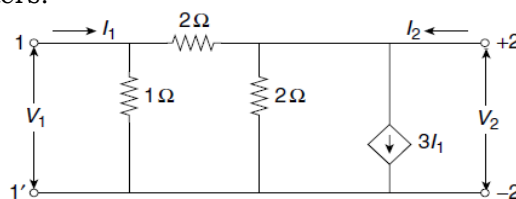| **6.** | Why do we need two port network? For the network, shown in Fig. 7., find Z-parameters. | **3+12** |

Fig. 7.

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