

Roll No: 

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**BTECH**  
**(SEM III) THEORY EXAMINATION 2023-24**  
**NETWORK ANALYSIS AND SYNTHESIS**

TIME: 3HRS

M.MARKS: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

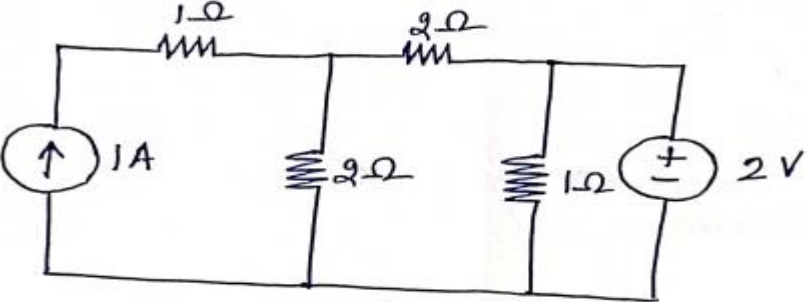
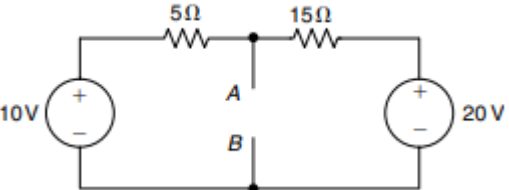
**SECTION A**

**1. Attempt all questions in brief.**

Q no.	Question	Marks	CO
a.	Draw the Dual of Series R-C Circuit with voltage source.	2	1
b.	State Tallegen's Theorem.	2	2
c.	Write the general formula for Fourier Transform.	2	3
d.	Write the Z Parameter equations related to any Two Port Network.	2	4
e.	Sketch the Frequency Response of Band Stop Filter.	2	5
f.	Draw the circuit diagram of Practical Voltage Source.	2	1
g.	State Compensation Theorem.	2	2
h.	What is the purpose of using Fourier Series?	2	3
i.	Write the Symmetry and Reciprocity condition of Z Parameter.	2	4
j.	Draw the Circuit diagram of Passive Band Pass Filter.	2	5

**SECTION B**

**2. Attempt any three of the following:**

Q no.	Question	Marks	CO
a.	Define Node and Mesh. Also Calculate current in all resistances shown in figure. 	10	1
b.	Define Norton's Theorem with circuit diagram. Also Sketch Norton's equivalent circuit for given figure with AB terminal as Load. 	10	2
c.	Write three properties of Fourier Transform with formulas and its use. Also calculate Fourier transform of signal $y(t)=e^{-3t}u(t)$ .	10	3
d.	Prove that for a symmetric two port network condition is $Z_{11} = Z_{22}$ , where $Z_{11}$ and $Z_{22}$ are open Circuit Impedance parameters.	10	4
e.	What is High Pass Filter? Derive the expression for transfer function of a High pass filter. Also, Sketch its Frequency Response curve.	10	5

Roll No: 

--	--	--	--	--	--	--	--	--	--	--	--

**BTECH**  
**(SEM III) THEORY EXAMINATION 2023-24**  
**NETWORK ANALYSIS AND SYNTHESIS**

TIME: 3HRS

M.MARKS: 100

**SECTION C**

**3. Attempt any one part of the following:**

a.	What is Nodal Analysis? Calculate current and voltage across 10 Resistor shown in figure.	10	1
b.	What is Duality? Write different rules of Duality with circuit diagram.	10	1

**4. Attempt any one part of the following:**

a.	State the following Theorems with Equivalent circuit diagram and equations. (i) Maximum Power Transfer Theorem (ii) Norton's Theorem (iii) Reciprocity Theorem	10	2
b.	Discuss Superposition Theorem with circuit diagram. Find 'i <sub>1</sub> ' using Superposition theorem for given circuit diagram.	10	2

**5. Attempt any one part of the following:**

a.	Explain Trigonometric Fourier series with formulas of Fourier Series Coefficient.	10	3
b.	Discuss Fourier Transform with formulas and its use. Also calculate Fourier transform of signal $x(t) = e^{-2t}u(t)$ .	10	3

**6. Attempt any one part of the following:**

a.	Calculate the Z and Y Parameter for the following two port Network.	10	4
b.	Find the Laplace transform of the given signal using Properties (i) $y(t) = te^{-2t}u(t)$ and (ii) $x(t) = 2u(t-3)$ .	10	4

**7. Attempt any one part of the following:**

a.	What is Low Pass Filter? Derive the expression for transfer function of a Low pass filter. Also, Sketch its Frequency Response curve.	10	5
b.	Derive the expressions of overall Z Parameter for Series Interconnection of '2' two ports network 'A' and network B.	10	5