

Code No: R20A0262

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, July/August 2023

Network Analysis & Transmission Lines

(ECE)

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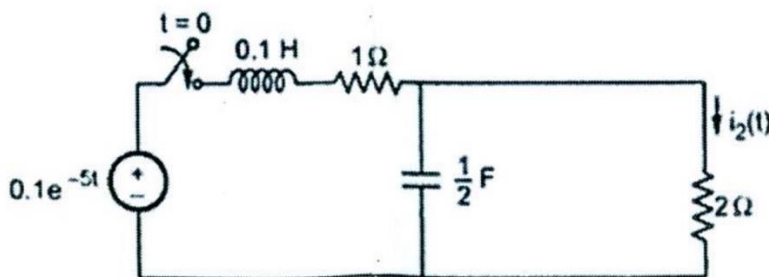
Time: 3 hours

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 Find $i_2(t)$ by Laplace transform method. [14M]



OR

- 2 A Explain the source free series RL circuit and derive the expression for $i(t)$ by direct method. [7M]
 B State and prove the initial value theorem. [7M]

SECTION-II

- 3 A Find the condition for reciprocity of a two-port network in terms of ABCD parameters. [7M]
 B Obtain the relation between Y and Z parameters. [7M]

OR

- 4 A The Z parameters of a 2 port network are $Z_{11}=20$, $Z_{22}=30$, $Z_{12} = Z_{21} = 10$ find the 'y' parameters of the network. [7M]
 B Derive the relationship between Z parameters and h parameters. [7M]

SECTION-III

- 5 A A series RLC resonant circuit includes $1\mu\text{F}$ capacitor, a resistance of 16Ω . If the bandwidth is 500 rad/sec. Determine: i) W_r ii) Q iii) L [7M]
 B Explain the procedure to draw the root locus diagram of RL series circuit when R is varying? [7M]

OR

- 6 A series RLC circuit with $R=100\Omega$, $L = 0.5\text{H}$, $C=40\mu\text{F}$ has an applied voltage of $100\angle 0^\circ$ with variable frequency. Calculate the resonance frequency, current at resonance and voltage across R, L, and C. Also calculate the Q-factor, upper and lower cutoff frequencies. [14M]

SECTION-IV

- 7 A Classify and explain the different types of loading of lines. [7M]
 B Define Propagation coefficient, phase distortion, reflection factor. [7M]

OR

- 8** **A** Derive the Campbell's formula for propagation constant of a loaded line? **[7M]**
 B Calculate the load reflection coefficient of open and short circuited lines? **[7M]**

SECTION-V

- 9** **A** Explain about $\lambda/8$ wave transformer? **[7M]**
 B Explain about $\lambda/4$ wave transformer? **[7M]**

OR

- 10** A 30 m long lossless transmission line with characteristic impedance (z_0) of 50 ohm is terminated by a load impedance (Z_L) = $60 + j40$ ohm. The operating wavelength is 90m. find the input impedance and SWR using smith chart? **[14M]**
