

ANURAG Engineering College

(An Autonomous Institution)

I B.Tech II Semester Supplementary Examinations, Jan/Feb-2024

ELECTRICAL CIRCUIT ANALYSIS – II

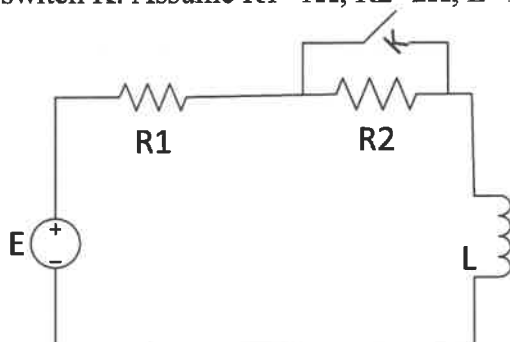
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours**Max. Marks: 60****Section – A (Short Answer type questions)****(10 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. What is the significance of time constant of a RL circuit?	CO1	L1	1M
2. A coil having a resistance of 2 ohms and an inductance of 1 henry is switched on to a 10 V DC supply. Write the expression of current $i(t)$ in the coil as a function of time.	CO1	L1	1M
3. Obtain the Laplace transform of $f(t)=1-e^{-at}$, a being a constant.	CO2	L1	1M
4. What is the Laplace transform of an exponential function?	CO2	L1	1M
5. Define network.	CO3	L1	1M
6. Why H-parameter representation is known as hybrid parameter?	CO3	L1	1M
7. Define an odd function with waveform.	CO4	L1	1M
8. What is Fourier transform?	CO4	L1	1M
9. Write down the classification of filters on the basis of frequency characteristics.	CO5	L1	1M
10. Write down the characteristics of an ideal band pass filter.	CO5	L1	1M

Section B (Essay Questions)**Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) Derive an expression for rise of voltage across the capacitor in a series RC circuit excited by a DC source. CO1 L3 10M
- OR**
- B) A coil with a self-inductance of 4H and a resistance of 10Ω is suddenly switched across a 20 V DC supply of negligible resistance. Determine the time constant of the coil, the instantaneous value of the current after 0.5 S and the time taken for the current to reach 80% of its final value. What is the final steady value of the current? CO1 L3 10M
12. A) Derive the transient response of series RL circuit for step input using Laplace Transform approach. CO2 L3 10M
- OR**
- B) In the figure, the battery voltage is applied for a steady state period. Obtain the complete expression for the current after closing the switch K. Assume $R_1=1\Omega$, $R_2=2\Omega$, $L=1H$, $E=10V$. CO2 L3 10M

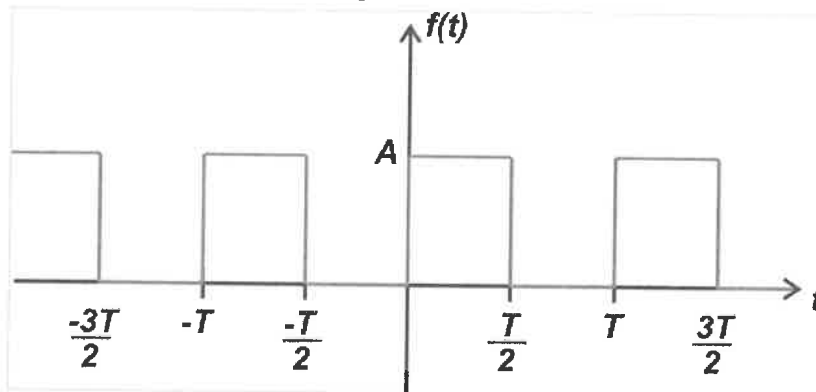


13. A) Derive the relationship between Z and ABCD parameters. CO3 L3 10M
OR

B) Find the transmission parameters of a cascaded network. CO3 L3 10M

14. A) Derive the exponential form of Fourier series. CO4 L3 10M
OR

B) Analyse the waveform using Fourier series CO4 L3 10M



15. A) Design a constant-k low pass filter. CO5 L3 10M
OR

B) A high-pass filter section is constructed from two capacitors of $1 \mu\text{F}$ each and a 15 mH inductance. Find i) cut-off frequency, ii) infinite frequency characteristic impedance, iii) characteristic impedance at 200 Hz and 2000 Hz , iv) attenuation at 200 Hz and 2000 Hz , and v) phase constant at 200 Hz and 2000 Hz . CO5 L3 10M