



R18 Regulation *Subject code: 2P3BB*
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Supplementary Examinations, December 2024

ELECTRICAL CIRCUIT ANALYSIS
(Electrical and Electronics Engineering)

Maximum Marks: 70

Date: 04.12.2024

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

| All the following questions carry equal marks (10X2M=20) Marks) | | CO | Bloom Tx |
|---|---|----|----------|
| 1 | Define Tree and Co-tree. | 1 | L1 |
| 2 | Define Ideal Transformer. | 1 | L1 |
| 3 | What is the time constant of RL Circuit? | 2 | L1 |
| 4 | Write the expression for current in series RL circuit? | 2 | L1 |
| 5 | Define Laplace and Inverse Laplace transform. | 3 | L1 |
| 6 | What the expression for current through and voltage across an inductor in S-domain? | 3 | L1 |
| 7 | Condition for reciprocity of ABCD-parameter. | 4 | L1 |
| 8 | Condition for reciprocity of y-parameter. | 4 | L1 |
| 9 | In constant k-type filter in T network k is? | 5 | L1 |
| 10 | In constant k-type filter in t network cut of frequency is? | 5 | L1 |

Part-B

| Answer All the following questions. (5X10M=50Marks) | | CO | Bloom Tx |
|---|--|----|----------|
| 11 | Explain Basic incidence matrix and Basic cut set matrix with example. [10M] | 1 | L2 |
| OR | | | |
| 12 | Two coupled coils with $L_1 = 0.01H$, $L_2 = 0.02H$ and $K = 0.4$ are connected in four different ways. [10M] Find effective inductance with (i) series aiding (ii) series opposing (iii) parallel aiding (iv) parallel opposing | 1 | L2 |
| 13 | Find the current in a series RL circuit having $R = 2\Omega$ and $L = 10H$ while a dc voltage of 100V is applied. What is the value of current after 5 sec of switching on. [10M] | 2 | L2 |
| OR | | | |
| 14 | Explain the initial condition of resistor, inductor and capacitor. [10M] | 2 | L2 |
| 15 | Derive step response of RL series circuit. [10M] | 3 | L2 |
| OR | | | |

| | | | | |
|----|--|-------|---|----|
| 16 | Derive the step response of series RC circuit. | [10M] | 3 | L2 |
| 17 | Determine open circuit parameter. | [10M] | 4 | L2 |
| OR | | | | |
| 18 | Find the z parameters of the following network | [10M] | 4 | L2 |
| | | | | |
| 19 | Expression for m-derive high pass filter. | [10M] | 5 | L2 |
| OR | | | | |
| 20 | Comparison of different types of filters. | [10M] | 5 | L2 |