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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (EE) PT (Sem.-1)

**CIRCUIT THEORY**

Subject Code : BTEE-301

M.Code : 70971

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

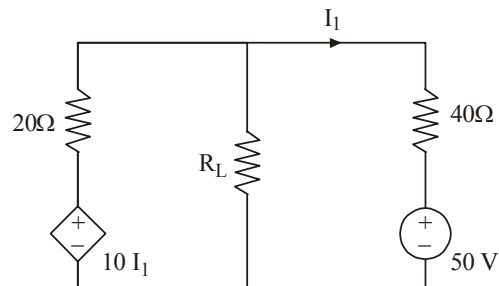
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

**SECTION-A****Write Briefly / Fill in the blanks :**

1. Differentiate dependent and independent sources.
2. State Superposition Theorem.
3. Distinguish between mesh and loop of an electric circuit.
4. Define quality factor of a series resonant circuit.
5. If a unit step current is passed through a capacitor, what will be the voltage across the capacitor?
6. Explain Convolution Theorem.
7. Define a transfer function.
8. Discuss the application of impedance and admittance parameters.
9. The cut-off frequency of constant k-low pass filter is \_\_\_\_\_.
10. The network function  $N(s)$  becomes \_\_\_\_\_ when  $s$  is equal to anyone of the zeros.

### SECTION-B

11. Determine  $R_L$  so as to have maximum power transfer to  $R_L$  in the given circuit.

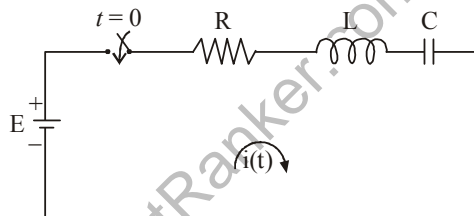


**Fig. 1**

12. Explain the initial value theorem.  
13. Discuss the impedance parameters of a two port network.  
14. Discuss the classification of filters.

### SECTION-C

15. When is a network either T or  $\pi$ , is said to be of the constant-k type?  
16. Discuss the response of the given RLC circuit excited by DC supply.



**Fig. 2**

17. Using Foster Form II synthesize the following function :

$$Z(s) = \frac{(s^2 + 5)(s^2 + 13)}{s(s^2 + 9)}$$

18. Write short notes :  
a)  $m$ -derived filters  
b) Cauer Forms.

**NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.**