

Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

**B.Tech.(EE) (2018 Batch) (Sem.-3)**  
**ELECTRICAL CIRCUIT ANALYSIS**  
Subject Code : BTEE-301-18  
M.Code : 76381

Time : 3 Hrs.

Max. Marks : 60

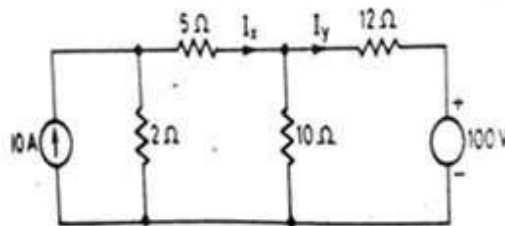
**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**Answer briefly :**

- 1) Find the number of branches in a network with seven nodes and five independent loops?
- 2) Define a impulse signal and unit doublet signal.
- 3) State superposition theorem. Give its limitations.
- 4) State the necessary and sufficient conditions for the function to be a positive real function.
- 5) What does pole and zero in a transfer function signify?
- 6) Find the initial value of the function  $f(t) = 8 - 2e^{-2t}$ .
- 7) Define RMS value and give its importance.
- 8) Under which conditions the sign of mutual coefficient will change?
- 9) How active filters are different from passive filters?
- 10) Determine the power dissipated in 5 ohm resistor.



### SECTION-B

- 11) Derive the condition for reciprocity and symmetry in case of h – parameters.
- 12) State and prove maximum power transfer theorem.
- 13) Determine the characteristic impedance and propagation constant of the symmetrical T-network.
- 14) For the given network draw the Pole-zero diagram and hence obtain the time domain response.

$$I(s) = \frac{s^2 + 4s + 3}{s^2 + 2s}$$

- 15) In a series RLC circuit having resistance 2 ohms, inductance 1 H, and capacitance 0.5 F. There is no initial charge on the capacitor. Find the resulting current if the switch is closed at  $t = 0$ .

### SECTION-C

- 16) What are composite filters? Design a composite low pass filter using ‘T’ network which is to be terminated in 400 ohm resistance. It must have a cut off frequency of 800 Hz with very high attenuation at 865 Hz, 1000 Hz and at  $\alpha$  (Infinity) Hz.
- 17) Enumerate the properties of RC impedance function and synthesize the given network in Cauer I and foster II forms.

$$z(s) = \frac{s^2 + 7s + 6}{(s + 2)}$$

- 18) Write a note on the following :
  - a) Duality and dual network
  - b) Series and parallel resonance

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