

Total No. of printed pages = 8

END SEMESTER EXAMINATION - 2019

Semester : 4th (New)

Subject Code : El-401

ELECTRICAL CIRCUIT AND NETWORK

Full Marks - 70

Time - Three hours

The figures in the margin indicate full marks for the questions.

Instructions :

1. All questions of PART-A are compulsory.
2. Answer any *three* questions from PART-B.

PART - A

Marks - 25

Time - One hour

1. Fill in the blanks : 1×10=10

- (a) A linear circuit is one whose parameters are constant ; they do not change with _____ and _____



[Turn over

- (b) A network having one or more than one source of emf is known as _____ network.
- (c) Admittance is equal to the reciprocal of _____.
- (d) The equation of reactive power is _____.
- (e) An ideal voltage source should have _____ source resistance.
- (f) Number of cycles per second is called _____.
- (g) Power taken by a resistance of 200 ohm with a flow of 10 amp current is _____ kwatt.
- (h) In delta connected three phase system, the line voltage is equal to _____.
- (i) In the two parallel branches of a parallel circuit, more current will flow through that branch which has _____ impedance.
- (j) At resonant condition of RLC series circuit _____.

2. Write true or false : $1 \times 10 = 10$

- (a) Kirchoff's first law is based on the principle of law of conservation of charge.
- (b) The voltages across all components in a parallel circuit are equal.

- (c) Thevenin's resistance is found by removing voltage sources along with their internal resistance.
- (d) Form factor is the ratio of rms value and average value.
- (e) A lagging power factor implies that voltage is lagging the current.
- (f) Product of voltage and reactive component of current gives reactive power.
- (g) Capacitor behaves like a short-circuit in DC excitation.
- (h) Thevenin's theorem can be applied only to DC circuit.
- (i) The total resistance in a parallel circuit is always less than the least resistor.
- (j) When a voltage of $v = V_m \sin \omega t$ is applied to a purely resistive circuit, the current flowing through it will be $i = I_m \sin \omega t$.



3. Choose the correct answers : $1 \times 5 = 5$

- (a) The nodal method of circuit analysis is based on
- (i) KVL and Ohm's Law
 - (ii) KCL and Ohm's Law
 - (iii) KCL and KVL
 - (iv) KCL, KVL and Ohm's

(b) A Network contains only an independent current and resistors. If the values of all resistors are doubled, the value of the node voltage will

- (i) become half
- (ii) remain unchanged
- (iii) become double
- (iv) None of the above

(c) Unit of admittance is

- (i) Ohm
- (ii) Siemens
- (iii) Henry
- (iv) Farad

(d) A R-L circuit has 6 ohm resistance and an inductive reactance. Its impedance will be _____ ohm.

- (i) 6
- (ii) 10
- (iii) 8
- (iv) 12

(e) In a three phase AC circuit, the sum of all three generated voltage is

- (i) Infinite
- (ii) One
- (iii) Zero
- (iv) None of these

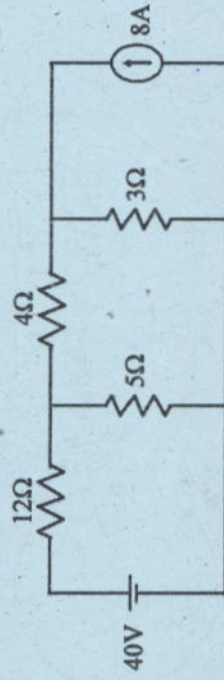
PART - B

Marks - 45

Time - Two hours

4. (a) State and explain Kirchoff's laws with the help of suitable example. 6

(b) Explain Superposition Theorem. Find the current passing through the 4 ohm resistor of the figure given below : 6



8. Write short notes on any *three* : $5 \times 3 = 15$

- (a) Transient response on R-L circuit.
- (b) Norton's theorem.
- (c) Maximum power transfer theorem.
- (d) RMS value, Average value, Form factor of alternating current.
- (e) Define Parameters, Linear circuits, Bilateral circuit and Electric Network.

