

1E1006

Roll No. \_\_\_\_\_

Total No of Pages: 4

**1E1006**

**B. Tech I Sem. (Back) Exam. Jan. 2016**  
**105 (Old) Electrical & Electronics Engineering**

**Time: 3 Hours**

**Maximum Marks: 80**  
**Min. Passing Marks: 24**

*Instructions to Candidates:*

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

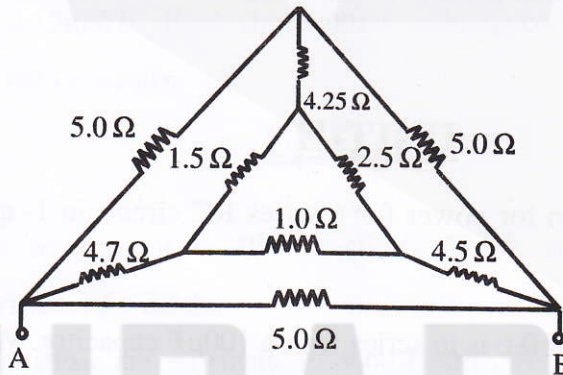
1. NIL

2. NIL

**UNIT-I**

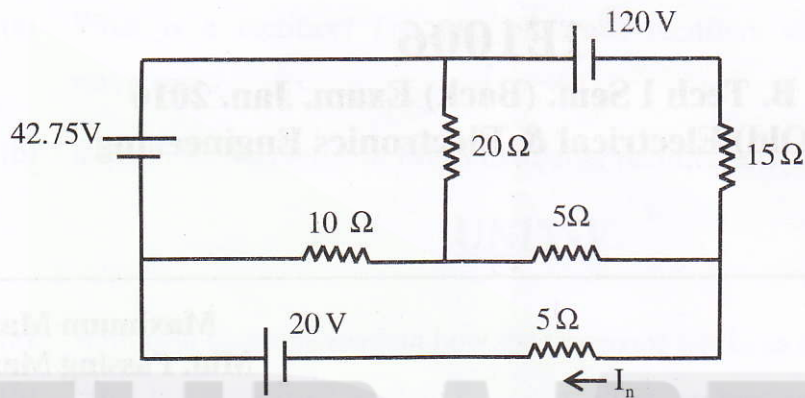
Q.1 (a) Find the equivalent resistance between the points A and B.

[8]



(b) Find the current  $I_n$  in the circuit using mesh analysis.

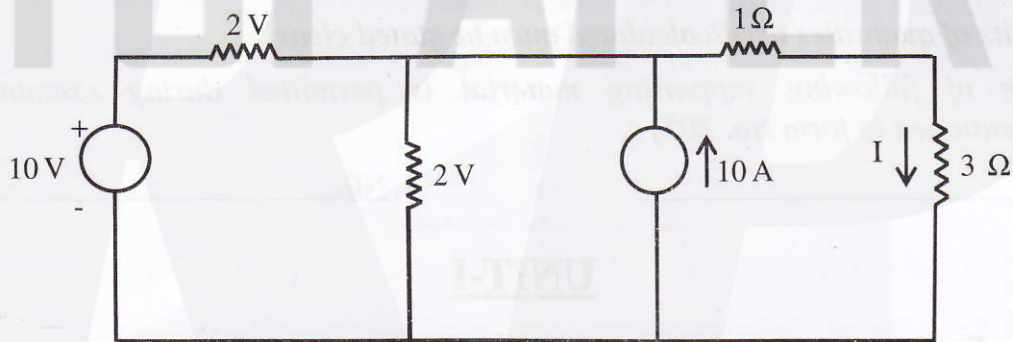
[8]



**OR**

Q.1 (a) Determine the current  $I$  through  $3\Omega$  resistor using Thevenin's theorem

[8]



(b) Explain superposition theorem with an example.

[8]

## UNIT-II

Q.2 (a) Derive the expression for power for a series RC circuit in 1- $\phi$  AC with phasor diagram.

[8]

(b) A coil of power factor 0.6 is in series with a  $100\mu\text{F}$  capacitor. When connected to 50Hz supply, the voltage across the capacitor is equal to voltage across the coil. Find the resistance and inductance of the coil,

[8]

**OR**

- Q.2 (a) Derive the relation between phase and line current for a three phase delta connection. Also draw the neat phasor diagram. [8]
- (b) Two wattmeters used to measure the power input in a 3-phase balanced circuit, indicate 1000 watts and 800 watts respectively. Find the PF of the circuit - [8]
- (i) When both readings are positive
- (ii) When the later is obtained by reversing the current coil connection

**UNIT-III**

- Q.3 (a) Derive the EMF equation of a 1-  $\phi$  transformer and define transformation ratio. [8]
- (b) The emf per turn of a 3300/395 V, 50Hz, 1-  $\phi$  transformer is 7.5V. If the maximum flux density is 1.0 tesla, find the suitable number of primary and secondary turns and net cross sectional area of the core. [8]

**OR**

- Q.3 (a) Explain the construction and working of a 1-  $\phi$  transformer. [8]
- (b) Two coils A and B having 1200 and 800 turns respectively are placed near each other. 60% of the flux of each coil is linked with the other coil. A current of 5A in coil produces a flux of 0.25mWb while the same current in coil B produces a flux of 0.15mWb. Find the mutual inductance and coefficient of coupling between the two coils. [8]

**UNIT-IV**

- Q.4 (a) What is biasing of a PN junction? Draw and explain the volt-ampere characteristics of a diode. [8]
- (b) Explain intrinsic and extrinsic semiconductors with neat diagram. [8]



**OR**

- Q.4 (a) What is a rectifier? Discuss full wave rectifiers with proper diagram and waveform. [8]
- (b) Explain various types of filters used after rectification of AC signals. [8]

**UNIT-V**

- Q.5 (a) With neat diagram, explain how the transistor works as an amplifier? [8]
- (b) What is a transistor? Explain its construction and biasing. [8]

**OR**

- Q.5 (a) Draw the common emitter configuration and its input-output characteristics. Also explain various operating regions of a transistor. [16]
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