Printed pages: 02   **Sub Code: NEE 201**

Paper Id: | 120203 | **Roll No:** | | | | | | | | | |

B TECH
(SEM. II) THEORY EXAMINATION 2017-18
BASIC ELECTRICAL ENGINEERING

Time: 3 Hours   *Total Marks: 100*

Note: Attempt all Sections. Assume missing data suitably, if any.

SECTION A

1. **Attempt *all* questions in brief.**   **2 x10 = 20**

   a) What is maximum power transfer theorem?

   b) Distinguish between mesh & loop of network.

   c) What is the significance of peak factor?

   d) Why the inductors are usually iron cored?

   e) Why interconnection of 3-phase system is necessary?

   f) What are the essentials of indicating instruments?

   g) On what factors does the magnetic reluctance depend?

   h) What is a function of transformer?

   i) What is the function of armature in a DC generator?

   j) Why are induction motors called 'asynchronous'?

SECTION B

2. **Attempt any *three* of the following:**   **10 x 3 = 30**

   a) Find current in R_3 of the network by using Thevenin's theorem.
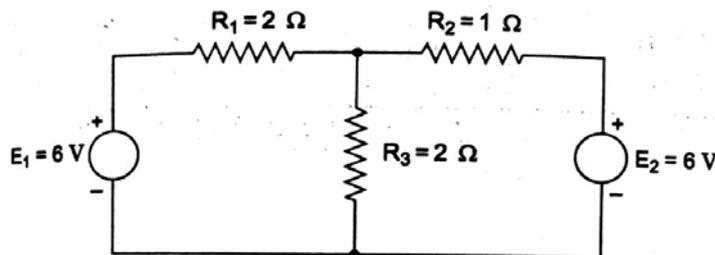

   b) Derive expressions for average value and rms value of a sinusoidally varying AC voltage.

   c) Explain two wattmeter method to measure 3-phase power in Y-connected load. Derive the phase angle in terms of wattmeter readings. Draw phasor diagram also.

   d) Discuss analogy between electric and magnetic circuits. On what factors does the magnetic reluctance depend? Is it constant at all flux densities?

   e) Enumerate all the parts of a DC machine. State the material and the function of each part.

SECTION C

3. Attempt any one parts of the following: 10 x 1 = 10

a) What is the use of delta-star and star-delta transformation in the circuits? Explain the method of transforming a star network into a delta network.

b) Find the current drawn I from the source voltage of 100 V in the circuit shown.
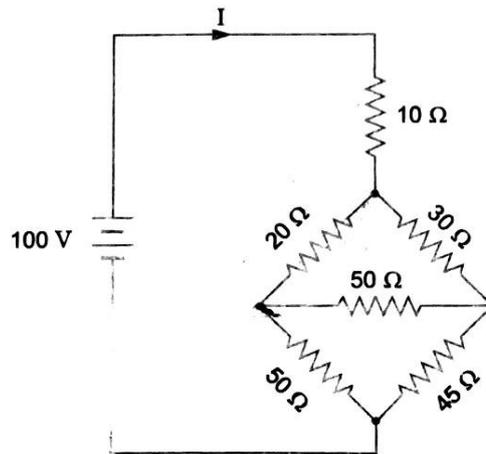
4. Attempt any one parts of the following: 10 x 1 = 10

a) In a purely inductive circuit, prove from first principles, that the current lags behind applied voltage by quarter of a cycle and also show that the average power demand is zero.

b) What are the causes of low power factor in supply system? Discuss its harming effects. How can the power factor be improved?

5. Attempt any one parts of the following: 10 x 1 = 10

a) Derive the relationship between the line and phase voltages of an alternator.

b) Derive the expression for torque produced in a moving coil type of instrument and explain, briefly, it's working.

6. Attempt any one parts of the following: 10 x 1 = 10

a) Explain what are hysteresis and eddy current losses. Discuss how these losses are reduced in transformer cores?

b) Draw and explain phasor diagram of transformer under loaded condition.

7. Attempt any one parts of the following: 10 x 1 = 10

a) Explain the principle of operation of a 3-phase synchronous motor.

b) Explain the principle of operation of a 1-phase induction motor.