Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech All Branches Physics (2018 Batch) (Sem.–1)

BASIC ELECTRICAL ENGINEERING

Subject Code : BTEE-101-18

Paper ID : [75339]

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

1. **Answer following questions in brief.**

   a. Define ideal and practical voltage and current sources.

   b. State and explain Kirchhoff's voltage law.

   c. Define RMS value of any alternating quantity.

   d. Write the voltage and current relations between line and phase values for star and delta connected three phase AC systems.

   e. Draw the power triangle and define various types of powers.

   f. Write the basic working principle of a transformer.

   g. What do you understand by an auto-transformer?

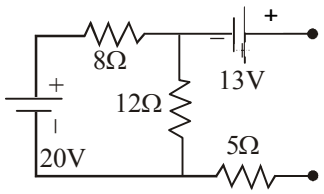
   h. Define synchronous speed and slip.

   i. Why commutator and brushes are used in DC machines?

   j. Define duty ratio of a converter.

SECTION-B

2. Calculate the Thevenin equivalent for the shown circuit.



3. Define the average value of alternating current having sine wave and derive its expression.

4. Explain the operation of series RL circuit with single phase AC supply.

5. Derive the EMF equation of a single phase transformer.

SECTION-C

6. Define resonance and derive the relation for resonance condition in a series RLC circuit.

7. Explain the construction of a single-phase transformer with the help of a neat sketch while mentioning the purpose of each component.

8. Explain the operation of a three-phase voltage source inverter with the help of its circuit diagram and associated waveforms.

9. Write short notes on any two of the following :

   a) DC buck and boost converters.

   b) Generation of rotating magnetic field in a 3-ph Induction Motor.

   c) Construction and working of a single phase induction motor.