Combined First and Second Semester B.Tech. Degree
Examination, January 2019
(2008 Scheme)
08.108 : BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(CMNPHEUARUFBS)

Time : 3 Hours
Max. Marks : 100

PART – A

Answer all questions :

1. State and explain Lenz’s law.

2. Define :
   1) mmf
   2) Reluctance.

3. Explain the concept of phase and phase difference.

4. Define RMS value and average value of an alternating quantity.

5. What are the advantages of High Voltage transmission ?

6. Distinguish between core type and shell type construction of Transformer core.

7. Compare Hydro-electric and Thermal power generation.

8. What is an ideal Diode ? Draw its characteristics ?

9. Explain the working principle of LED ?

10. Draw the circuit for a Capacitor filter and explain how does it reduce the ripple factor ?

(10×4=40 Marks)

P.T.O.
PART - B

Answer one full question from each Module:

Module - I

11. a) For the R-L-C series circuit shown in fig. calculate current, power factor and power consumed.

\[ \begin{align*}
\text{15} \, \Omega & \quad 0.15 \, \text{H} \\
& \quad 100 \, \mu \text{F}
\end{align*} \]

230 V, 50 Hz

b) An iron ring of cross sectional area of 6 cm\(^2\) is wound with a wire of 100 turns and the ring has a saw cut of 2 mm shown below. Calculate the magnetizing current required to produce a flux of 0.1 mWb if mean length of magnetic path is 30 cm and relative permeability of iron is 470. Neglect magnetic leakage and fringing.

\[ \begin{align*}
\text{N=100} & \quad 2\text{mm} \\
& \quad l = 30 \, \text{cm} \\
& \quad A = 6\text{cm}^2
\end{align*} \]

c) For the half wave rectified sinusoidal alternating current, find the following:

1) RMS value
2) Average value.

OR

12. a) Determine the current through 20\(\Omega\) resistor in the circuit shown in figure:

\[ \begin{align*}
\text{A - B - C - D - E - F - G - H}
\end{align*} \]
b) Each branch of a 3-phase star connected load consists of a coil of resistance 4.2Ω and reactance 5.6Ω. The load is supplied at a line voltage of 415 V, 50 Hz. The total power supplied to the load is measured by the two wattmeter method. Find the wattmeter readings.

Module – II

13. a) Explain the typical layout of a hydro-electric power generation project.
   b) List out the various substation equipments and explain their function.
   c) Differentiate between Fuse and MCB used in domestic installations.
   OR

14. a) Explain with the help of a neat block diagram various types of primary and secondary distribution system.
   b) What is the role of an ELCB in domestic wiring circuit? Also explain the working of ELCB.

Module – III

15. a) A half wave diode rectifier has a voltage drop across the diode when conducting is 0.7V. The load resistance is 600Ω. The RMS value of the ac input is 28.87V. Calculate \( I_{dc} \), \( I_{rms} \), PIV and form factor.
   b) Explain the working principle of UPS.
   c) Explain the construction and V-I characteristics of SCR.
   OR

16. a) Draw the circuit diagram for a centre-tap full-wave rectifier and explain its operation with the help of input and output voltage waveforms.
   b) Explain the construction and V-I characteristics of TRIAC.
   c) Write a short note on Photo diode.