

FACULTY OF ENGINEERING
B.E. I-Semester (AICTE) (New) (Main) Examination, July 2021

Subject: Basic Electrical Engineering

Max. Marks: 70

Time: 2 hours

- Note:** i) First Question is compulsory. Answer any three questions from the remaining six questions.
 ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
 iii) Missing data, if any, may suitably be assumed.

Answer any four questions from the following.

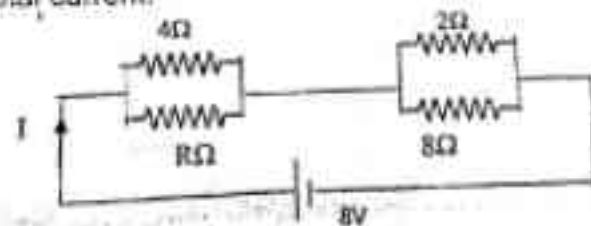
(4 x 4 = 16 Marks)

- 1 (a) Explain Ohm's law and its limitations.
- (b) Draw the power triangle of RC circuit and explain in detail.
- (c) What is meant by slip of an Inductor motor and why it must be present for motor action?
- (d) The primary winding of an electric train transformer has 400 turns and the secondary has 50. If the input voltage is 120V (rms) what is the output voltage?
- (e) Why is there phase difference between voltage and current in an a.c. circuit? Explain the concept of power factor.
- (f) What are the advantages of 3 phase circuits over single phase circuits?
- (g) List the applications of DC shunt motor.

(3 x 18 = 54 Marks)

2 (a) Explain the mesh analysis of solving a network with an example.

(b) The total power consumed by the given network is 16W. Find the value of R, power dissipated in R & total current.



- 3 (a) The current in an inductive circuit is given by $0.3 \sin(200t - 40^\circ)$ A. Write the equation for the voltage across it if the inductance is 40 mH.
 - (b) A 440V, 3 phase, 50 Hz supply is fed to three coils, star connected each having a resistance of 25Ω & an inductive reactance of 20Ω . Calculate
 (i) line current (ii) power factor (iii) power supplied $\rightarrow P_{\text{max}}$
 - (c) Mention any three advantages of AC over DC.
- 4 (a) Describe the operation of single phase transformation explaining clearly the functions of the different parts. Why cores are laminated?
 - (b) A 3 phase, 460V, 100 H.P., 60Hz 4 pole Induction machine delivers rated output power at a slip of 0.05. Determine the (i) synchronous speed (ii) motor speed (iii) frequency of rotor current (iv) slip speed.

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