

Section C

5. (a) Explain working of an Energy meter by drawing neat and clean constructional diagram. 7
(b) Elaborate the advantages, limitations and application of Moving Iron instruments. 5
6. (a) What is the significance of B-H curve ? Draw the B-H curve of a ferromagnetic material and define the following terms :
(i) Magnetic saturation
(ii) Residual magnetism
(iii) Coercive force. 8
(b) Define the terms : 4
MMF, Magnetic Flux, Magnetic reluctance and permeability. Also name the units in which quantities are measured.

Section D

7. (a) Drive the EMF equation of Transformer. Name the factor on which induced EMF depends. 6
(b) A 3- ϕ 4 pole induction motor is supplied from 3 ϕ 50 Hz ac supply. Find : 6
(i) Synchronous speed

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B. Tech. EXAMINATION, 2022

Semester II (CBCS)

PRINCIPLES OF ELECTRICAL ENGINEERING

EE-101

Time : 3 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

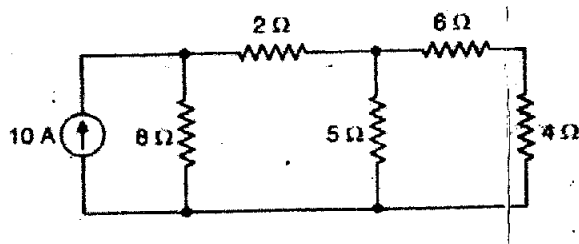
Note : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. 9 is compulsory.

Section A

1. (a) Draw general layout of Electrical power system and explain the function of its components. 6

- (b) What are the main parts of a Nuclear Reactor ?
Explain their functions. 6

2. (a) State Thevenin's theorem and explain the steps involved in this theorem in detail. 6
(b) Using Norton's theorem, calculate the current in the 5Ω resistor in the circuit shown in given below fig. : 6

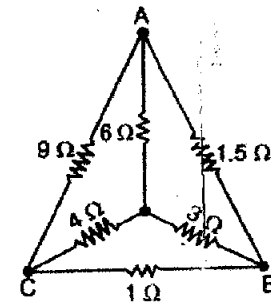


Section B

3. (a) Explain the behaviour of A.C. through a RLC series circuit. Also find out the values of Voltage, Current and Power through RLC series circuit. 8
(b) A inductor coil is connected to a supply of 250 V at 50 Hz and takes a current of 5A. The coil dissipates 750 W. Calculate :
(i) Power Factor

- (ii) Resistance of coil
(iii) Inductance of coil
(iv) Reactance of coil. 4

4. (a) A network of resistors is shown in given below Fig. Find the resistance between : 6
(i) terminals A and B
(ii) terminals B and C
(iii) terminals C and A.



- (b) Prove with the help of suitable vector diagram that Power in a 3-phase balanced circuit can be measured from the reading of two Wattmeters. Also discuss the nature of power factor when :
(i) Two wattmeters read equal and opposite value
(ii) One of the wattmeters indicate zero value. 6

- (h) Differentiate between Mesh and Loop in an Electric circuit.
- (i) What is the condition for maximum efficiency of Transformer ?
- (j) What is the significance of back EMF in D.C. motor ?
- (k) How creeping can be avoided in energy meter ?
- (l) Which motor is used in fan ? $1 \times 12 = 12$

- (ii) rotor speed when slip is 4%
- (iii) the rotor frequency when runs at 600 r.p.m.

8. (a) Draw the circuit diagram of a capacitor start capacitor run single-phase induction motor. Also explain its working and mention its application. 6
- (b) Write short notes on the following : 6
- (i) Methods of speed control of DC motor and
- (ii) Need of DC motor starter.

(Compulsory Question)

9. (a) Define Maximum Power Transfer Theorem.
- (b) What do you mean by power factor ? What are its disadvantages ?
- (c) What do you mean by Q-factor ?
- (d) Differentiate between core type and shell type transformer.
- (e) Define Voltage regulation of Transformer.
- (f) What are the Active and Passive sources ?
- (g) What are the different types of losses in a Transformer ?