

2063  
B.E. (Electrical and Electronics Engineering)  
Second Semester  
EEEEC-201: Basic Electrical Engineering

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part.

x-x-x

**Que.1**

- (a) What are the primary functions of transformers in power transmission distribution system?
- (b) What are the advantages of a poly-phase system over the single-phase system?
- (c) Differentiate between root mean square and average value of alternating quantities.
- (d) Define the terms efficiency and voltage regulation with respect to transformer.
- (e) Compare electrical circuits with magnetic circuits in respect of different quantities.

(5x2)

**PART -A**

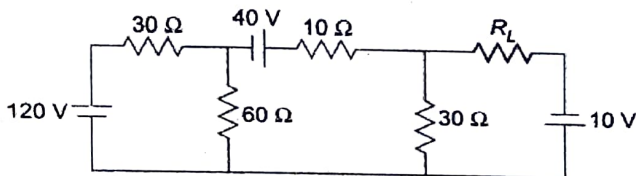
**Que. 2** (a) An alternating current takes 3.375 ms to reach 15 A for the first time after becoming instantaneously zero. The frequency of the current is 40 Hz. Find the maximum value of the alternating current. (5)

(b) Explain behavior of a pure capacitor when connected across a single-phase ac supply. Show that the average power absorbed by a capacitor is zero. (5)

**Que.3** (a) Explain the method of measurement of balanced three phase power by two wattmeter method. Draw the neat circuit diagram. (5)

(b) Three coils, each of 5W resistances, and 6W inductive reactance are connected in closed delta and supplied from a 440V, three-phase system. Calculate the line and phase currents, the power factor of the system and the intake in watts. (5)

**Que.4** 6 State and explain Norton's theorem. Obtain Norton's equivalent network as seen by  $R_L$



(10)

P.T.O.

(2)

**PART - B**

**Que. 5** (a) What are the different types of losses in a transformer? Write an expression for efficiency and develop a condition for maximum efficiency. (5)

(b) Derive the emf equation of a dc generator. Explain all the symbols with their units. (5)

**Que. 6** (a) Give a brief account of squirrel-cage induction motor. Explain qualitatively as to how it develops torque and the nature of its torque-slip characteristic. Why is it called asynchronous motor? (5)

(b) A 125 kVA transformer having a primary voltage of 2200 V at 50 Hz has 182 primary turns and 40 secondary turns. Neglecting losses calculate (i) full load primary and secondary currents and (ii) no load secondary induced emf. (5)

**Que. 7** (a) Define the main magnetic quantities needed to deal with magnetic circuits. How are these inter-related? (5)

(b) Draw a general single-line diagram from power generation to distribution. (5)

x-x-x