

5. (a) Discuss series resonance. Define resonant frequency, cut off frequencies, bandwidth. 7.5
 (b) Discuss the operation of boost converter in detail. 7.5
6. (a) Explain the construction and working of three-phase induction motor. 7.5
 (b) Explain the speed control methods of separately excited DC motor. 7.5
7. (a) Discuss the importance of earthing. 5
 (b) Define power factor. Discuss different methods for its improvement. 5
 (c) What are different components of LT switchgear ? Discuss in detail. 5

Roll No.

Total Pages : 04

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B. Tech. (CSE (AIML)) (Second Semester)

Basic Electrical Engineering

(ESC-101)

Time : 3 Hours]

[Maximum Marks : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) What are the advantages of three-phase system over single-phase system ? 1.5
 (b) Explain the duality between Thevenin's and Norton's equivalent circuits. 1.5
 (c) What are dependent and independent sources ? 1.5
 (d) What is the purpose of using laminated core in a transformer ? 1.5
 (e) Classify the losses in transformer. 1.5
 (f) On what principle the synchronous generators operate ? 1.5

- (g) What is the function of commutator in DC machines ? 1.5
- (h) What is Sinusoidal Pulse width modulation ? 1.5
- (i) What are different types of batteries ? 1.5
- (j) Define Real Power, Reactive Power and Apparent Power. 1.5

Part B

2. (a) A pure resistance of 50 ohms is in series with a pure capacitance of 100 micro farads. The series combination is connected across 100 V, 50 Hz supply. Find : 7.5
- the impedance
 - current
 - power factor
 - voltage across resistor
 - voltage across capacitor
- (b) Find the current in 10 ohm resistance by using superposition theorem in Fig 1. 7.5

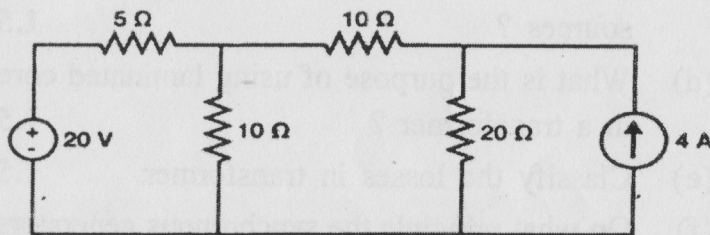


Fig 1.

3. (a) Find the average value, rms value, form factor and peak factor for a full wave rectified sine wave. 7.5
- (b) A balanced star connected load of $(8 + j6)\Omega$ per phase is connected to a 3-phase 400V supply. Find : 7.5
- Line current
 - Power Factor
 - Power absorbed
 - Reactive volt-amperes
 - Total volt-amperes.
4. (a) Explain working principle of autotransformer. What are its advantages, disadvantages and applications ? 5
- (b) Define Voltage Regulation. Derive the expression for maximum efficiency in a transformer. 5
- (c) In a 25 kVA, 2000/200 V, single-phase transformer, the iron and full load copper losses are 350 W and 400 W respectively. Calculate the efficiency at unity power factor on : 5
- full load
 - half-full load