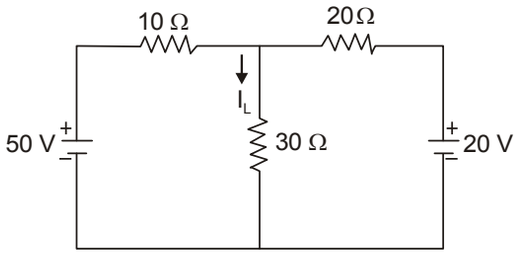
Solved Paper 2011

Electrical Engineering

(Paper II)

1. Find I_L for the circuit shown in figure, using Superposition theorem. (30)



Figure

2. Two impedances $Z_1 = (8 + j6)\Omega$ and $Z_2 = (3 - j4)\Omega$ are in parallel and this combination takes 25 A. Determine the current and power taken by each branch. (30)

3. Derive and explain the two Wattmeter method of measurement of three phase power for a balanced star connected load. Discuss the variations in readings for different power factors of loads from unity to zero. (30)

4. A short shunt compound d.c. generator delivers 100 A to a load at 250 V. The generator has shunt field, series field and armature resistance, 130 Ω, 0.1 Ω and 0.1 Ω respectively. Calculate the voltage generated in armature winding. Assume 1 V drop per brush. (30)

5. Explain the working principle of three phase synchronous motor. (30)

6. Show that maximum stress in a single-core cable is $\frac{2V}{d \log_e D/d}$

Where V is the operating voltage, d and D are the conductor and sheath diameter. (30)