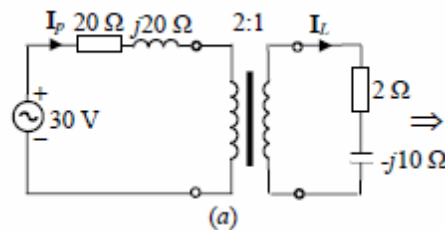


ELECTRICAL SCIENCE -2 15B11EC211

Tutorial No: 7

Q.1 A single-phase, 50-Hz transformer has 30 primary turns and 350 secondary turns. The net cross-sectional area of the core is 250 cm². If the primary winding is connected to a 230-V, 50-Hz supply, calculate (i) the peak value of flux density in the core, (ii) the voltage induced in the secondary winding, and (iii) the primary current when the secondary current is 100 A (neglect losses).

Q.2: Determine the load current I_L in the ac circuit shown in Fig



Q.3: A single-phase, 40-kVA, 6600-V/250-V, transformer has primary and secondary resistances $R_1 = 10 \Omega$ and $R_2 = 0.02 \Omega$, respectively. The equivalent leakage reactance as referred to the primary is 35 Ω. Find the full-load regulation for the load power factor of (a) unity, (b) 0.8 lagging, and (c) 0.8 leading

Q.4: A single-phase, 150-kVA, 5000-V/250-V transformer has the full-load copper losses of 1.8 kW and core losses of 1.5 kW. Find

- (a) The number of turns in each winding for a maximum core flux of 60 mWb.
- (b) The efficiency at full rated kVA, with power factor of 0.8 lagging.
- (c) The efficiency at half the rated kVA, with unity power factor.

Q5. A 4 pole , 1200 rpm dc generator has a lap wound armature having 65 slots and 12 conductors per slot. If the flux per pole is 0.02 Wb, find the emf induced in armature?

Q6. The induced emf in a dc machine while running at 500 rpm is 180V. Assuming constant magnetic flux per pole, find the induced emf when machine runs at 600 rpm.