

# JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

## Mid Term Examination

(Summer Semester, June 2018)

**COURSE TITLE: Elect. Machines and Instruments**

**MAXM. MARKS:50**

**COURSE CODE: 10B11EC311**

**MAXM. DURATION: 2 Hrs.**

*Note: 1. Attempt all questions and each question carries FIVE marks.*

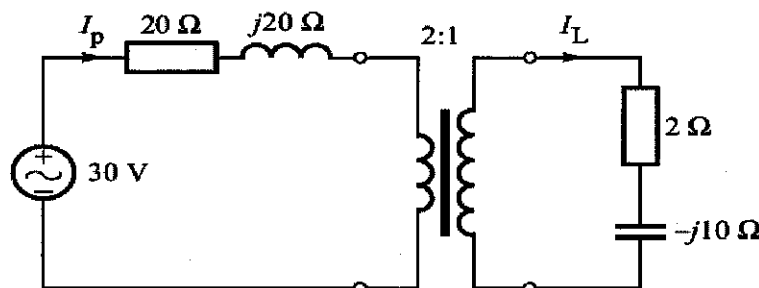
*2. Carrying of mobile phone during exam. shall be treated as the case of unfair means.*

Qu.1: Define and explain the following terms with the help of one example of each:

MMF, Reluctance, Relationship between B and H

Qu.2: What do you mean by the step up/down transformer? Explain the working principle of single phase transformer.

Qu.3: Determine the load current  $I_L$  in the ac circuit shown.



Qu.4: In what way eddy current loss and hysteresis loss are related to the supply frequency? Also derive the condition for maximum efficiency of the transfer.

Qu.5: A single-phase, 440-V/110-V, 50-Hz transformer takes a no-load current of 5 A at 0.2 power factor lagging. If the secondary supplies a current of 120 A at a power factor of 0.8 lagging to a load, determine the primary current and the primary power factor. Also, draw the phasor diagram.

Qu.6: 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, determine the emf induced in the armature.

Qu.7: A separately excited dc generator is connected to a load of  $60\Omega$  to which a current of 8 A is supplied. If the armature resistance is  $1\Omega$ , determine - terminal voltage, and generated emf.

Qu.8: Prove that in case of D.C. generator, maximum efficiency is obtained when the variable loss equals constant loss.

Qu.9: What do you mean by the critical field resistance and critical speed? What is condition of voltage build-up in case of D.C. generator?

Qu. 10: In case of synchronous machine, explain the construction of: rotor, stator, and exciter. Also, explain with proper reason why the synchronous motor is not self-starting.