

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Test -1 EXAMINATION, OCTOBER 2017

B.Tech III Sem. (ECE, CE)

COURSE NAME: Electrical Machines and Instruments

MAX.MARKS:15

COURSE CODE: 10B11EC311

MAX.TIME: 1 HR.

Note: All questions are compulsory. Carrying of mobile phones during examinations will be treated as a case of unfair means.

- Q1. (a) Explain in what respect magnetic circuit differs from an electric circuit? (2)
- (b) In the magnetic circuit shown in Fig. 1, the limbs B and C have areas of cross-section 0.01 m^2 and 0.02 m^2 , and air gaps of 1 mm and 2 mm , respectively. If the flux in limb B is 1.5 mWb , find the flux in limb A, assuming permeability of iron to be infinite. Also determine the value of exciting current I, if the coil has 500 turns. (3)
- Q2 (a) Explain the working principle of partial ideal transformer connected to load. (2)
- (b) Draw the equivalent circuit of practical transformer referred to primary and secondary side along with explanation of its each component. Also plot the phasor diagram of ideal transformer. (3)
- Q3 (a) The primary and secondary windings of a 30-kVA , $6000\text{-V}/230\text{-V}$, single-phase transformer have resistances of 10Ω and 0.0016Ω , respectively. The total reactance of the transformer as referred to the primary side is 23Ω . Calculate the percentage regulation of the transformer when supplying full-load current at a power factor of 0.8 lagging. (2)
- (b) Define efficiency of DC generator and derive condition for its maximum efficiency. (3)

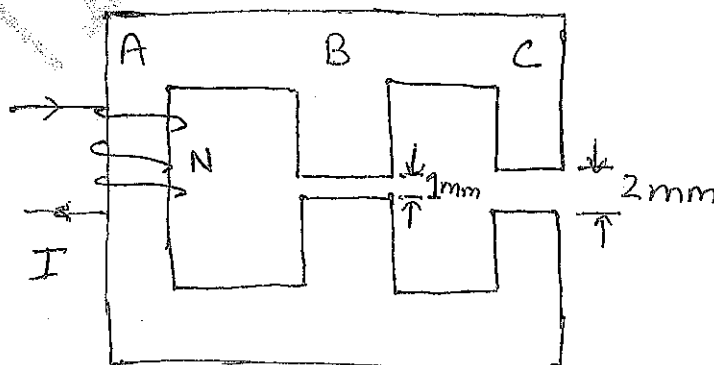


Fig. 1