

Code No: R21041

R10**SET - 1****II B. Tech I Semester Supplementary Examinations, Oct/Nov- 2017****ELECTRICAL TECHNOLOGY**

(Com. to ECE, EIE, BME)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Explain the different parts of a DC machine with the function of each part (8M)  
b) A long – shunt compound – wound dc generator delivers a load current of 100 A at 400 V. The armature, series and shunt field resistances are  $0.04\Omega$ ,  $0.02\Omega$  and  $200\Omega$  respectively. Find the armature current and the generated emf (7M)
2. a) Derive the condition for maximum efficiency of a dc generator of shunt type (7M)  
b) Explain the Swinburne's test method and its usage (8M)
3. a) Explain the principle of operation of a Transformer (7M)  
b) A 200/50 V, 50 Hz transformer has a core area of  $100\text{ cm}^2$ . The maximum value of the flux density is  $1\text{ Wb/m}^2$ . Assuming 9% loss of area due to laminations, find the primary and secondary number of turns and transformation ratio (8M)
4. a) Derive the condition for maximum efficiency of a transformer (8M)  
b) Explain the differences between a Power transformer and Distribution transformer (7M)
5. a) Explain the principle of operation of a three phase induction motor (7M)  
b) A three – phase, 50 Hz, six – pole induction motor runs at 950 rpm. Calculate i) the synchronous speed, ii) the slip and iii) frequency of the rotor emf (8M)
6. a) Explain the principle of operation of Alternator (5M)  
b) What is armature reaction? Explain the effect of armature reaction on the terminal voltage of alternator at i) Unity power factor load ii) lagging power factor load and iii) leading power factor load. (10M)
7. a) Draw and explain the equivalent circuit of a single phase Induction motor at Stand still (8M)  
b) Explain in detail about Variable reluctance stepper motor (7M)
8. Write Short notes on the following: (15M)  
i) AC servo motors  
ii) PMMC Instrument