

II B. Tech I Semester Supplementary Examinations, May/June-2016
ELECTRICAL MACHIENS-I
 (Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) Discuss briefly the principle of energy conversion (4M)
- b) Define the terms Front pitch, back Pitch, Commutator Pitch with respect to armature windings connections (4M)
- c) Why is Yoke laminated in DC machines? (3M)
- d) Give advantages and disadvantages of Ward – Leonard Drives (4M)
- e) Explain what would happen if the DC Motor is directly switched on to the supply without any starter (3M)
- f) Distinguish between Cumulative and Differential Compound Motors (4M)

PART -B

2. Derive an expression for the torque in a Doubly excited system having salient - pole type of stator as well as rotor. State the assumption made (16M)
3. a) Explain the constructional details of commutator of a DC Machine and give its functions. (8M)
- b) A 15 KW, 250 V, 6 pole lap connected dc generator runs at 1200 rpm. Armature has 500 conductors. For full load armature – ohmic loss of 200 W, find the useful flux per pole. Take 2 V as the brush drop at full load (8M)
4. a) Derive the expression for the emf generated in a DC Machine (8M)
- b) Sketch and explain the load characteristics of the Shunt and Series Generator (8M)
5. a) Explain the process of commutation in Dc machines through the reversal of current in a coil (8M)
- b) Determine the AT/pole for each inter pole of a 4 pole generator with 88 slots each containing 900 ampere - conductors. The inter pole air gap is 0.01m and the flux density in the inter pole air gap is 0.3 T. The effects of iron parts of the circuits and leakage may be neglected. (8M)
6. a) Sketch and explain the speed torque characteristics of DC Shunt, series and cumulative Compound motors. (8M)
- b) A DC Series motor, with unsaturated magnetic circuit and negligible resistance, when running at a certain speed on a given load, takes 50 A at 500 V. If the load torque varies as the cube of the speed, find the resistance to be inserted to reduce the speed by 50 %. (8M)
7. Write short notes on the following: (16M)
 - a) Specific Electric and Magnetic Loadings
 - b) Swinburne's test

