

Code: 9A02303

B.Tech II Year I Semester (R09) Supplementary Examinations December 2015

**ELECTRICAL & MECHANICAL TECHNOLOGY**

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Minimum of two questions from each part should be chosen for answering five questions.

All questions carry equal marks

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**PART – A**  
**(Electrical Technology)**

- 1 (a) Derive the torque equation of DC motor.  
(b) How DC generators are classified? Explain in detail with neat diagrams.
- 2 (a) Derive e.m.f equation of single phase transformers.  
(b) Define and explain efficiency and regulation.
- 3 (a) Explain the principle of operation of 3-phase induction motor.  
(b) What is regulation? How will you find regulation by synchronous impedance method? Explain with neat diagram.
- 4 Explain the principle and operation of attraction type moving iron instruments with neat diagram.

**PART – B**  
**(Mechanical Technology)**

- 5 (a) What are the differences between TIG and MIG welding processes?  
(b) Explain destructive and non-destructive testing of welds.
- 6 Describe briefly and with appropriate sketches, the actual sequence of events in the cylinder of a petrol engine working on the four stroke cycle.
- 7 Draw P-V and T-S diagram for a single stage reciprocating air compressor without clearance. Derive the expression for work done when compression is: (i) Isothermal. (ii) Isentropic.
- 8 (a) Explain with a neat sketch the working principle of simple vapour compression refrigeration system.  
(b) Write short notes on the following:
  - (i) Rope drives.
  - (ii) Chain drives.
  - (iii) Bulldozers.

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