

**R09****Code: 9A14301****B.Tech II Year I Semester (R09) Supplementary Examinations, May 2013****ELECTRICAL ENGINEERING****(Mechatronics)****Time: 3 hours****Max. Marks: 70**

Answer any FIVE questions  
All questions carry equal marks

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1. (a) State and explain Kirchhoff's laws.  
(b) Explain basic circuit components in detail.
2. (a) Write short notes on star to delta transformation.  
(b) State and explain maximum power transfer theorem by taking an example.
3. (a) Define and derive the expressions for peak factor of a sinusoidal wave form excited by a A.C voltage source.  
(b) Show that power dissipated by a pure inductive circuit is zero.
4. Explain the principle of operation and constructional details of transformers.
5. Explain the types of DC generators with neat circuit diagram in detail.
6. (a) Explain the losses that occur in DC machines.  
(b) Define and derive the torque equation of DC motors.
7. Explain the principle of operation of 3-phase induction motors.
8. (a) What are the essential features of measuring instruments?  
(b) Explain the principle and operation of permanent magnet moving coil instruments with neat diagram.

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