Code :9A02303

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II B.Tech I Semester(R09) Supplementary Examinations, May 2011
ELECTRICAL & MECHANICAL TECHNOLOGY
(Civil Engineering)

Time: 3 hours **Max Marks: 70**

(Note: Minimum of two questions from each part should be chosen for answering five questions)

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PART-A

1. (a) With a neat sketch, explain the working of a three point starter for D.C shunt motor.
   (b) Derive the expression of back EMF in a D.C motor and briefly describe its role.
2. (a) Derive the condition for maximum efficiency of a transformer.
   (b) A 30 KVA single phase transformer has an iron loss of 457 watts and copper loss of 125 watts when delivering half the full load. At what percentage of full load will the transformer have maximum efficiency.
3. (a) Explain the constructional features of alternator.
   (b) A 3 phase, 6 pole alternator is coupled to an engine running at 1200 rpm. The alternator supplies an induction motor which has a full load speed of 1164 rpm. Find the slip and number of poles of the motor.
4. (a) Explain with neat sketch, the principle of operation of permanent magnet type moving coil instrument.
   (b) Discuss the classification of electrical instruments.

PART-B

5. (a) Explain the principle of arc welding. Give the list of equipments required is general for electric arc welding.
   (b) Describe the TiG welding method and its specific applications.
6. (a) Explain with help of neat sketch the working of a steam engine.
   (b) Explain with neat sketch closed cycle gas turbine plant.
7. (a) In a two stage compressor, prove that the work done on 1kg of air is minimum with perfect intercooling when the intermediate pressure is the geometric mean of the suction and delivery pressure.
   (b) Deduce the relation between the tension on the tight side and slack side of a belt connecting two pulleys and transimitting power. Neglect the centrifugal effect of the belt mass.
8. (a) Explain the block diagram of a vapour compresson refrigeration system.
   (b) Explain the belt and bucket conveyers with neat sketch. How can these conveyers are used as mechanical handling equipments?

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