

**GUJARAT TECHNOLOGICAL UNIVERSITY****M.E Sem-I Remedial Examination April 2010****Subject code: 710706****Subject Name: Energy Management****Date: 10 / 4 / 2010****Time: 12.00 noon – 02.30 pm****Total Marks: 60****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a) What is reduction in efficiency of rewound induction motor? Why does such a reduction take place? 06
- (b) Which arc furnace is energy efficient: 10 tonne or 150 tonne? Explain with reason. 06
- Q.2 (a) Discuss the points of energy wastage in a power system? 06
- (b) State the efficiency of (i) Boiler (ii) Turbine (iii) Generator in power station of 110 MW. 06
- OR**
- (b) Compare the efficiencies of power and distribution transformers. 06
- Q.3 (a) What is the condition for maximum efficiency of Power transformer and Distribution transformer? 06
- (b) At which percentage load the condition of maximum efficiency is fulfilled in (i) Power transformer and (ii) Distribution transformer? 06
- OR**
- Q.3 (a) Explain how an energy-efficient induction motor is designed? State the efficiencies of 5 H.P., 10 H.P. and 20 H.P. induction motors at full load. 06
- (b) Explain how the star delta controller proves useful in the case of large induction motor for group drive? 06
- Q.4 (a) Explain why an unbalanced supply or low voltage supply is responsible for reduction in efficiency in induction motor? 06
- (b) Explain why a 4 core cable is considered superior over a 3-1/2 core cable in modern distribution practice. 06
- OR**
- Q.4 (a) Explain how a 12 pulse converter is operated in HVDC transmission system? Which harmonics are present on its AC side. 06
- (b) Which are the harmonics generated by arc furnace and arc welding? 06
- Q.5 (a) State the qualitative parameters of quality power. 06
- (b) Explain how the qualitative parameters affect the efficiency of induction motor and distribution system? 06
- OR**
- Q.5 (a) Explain the series and shunt compensation for voltage control. 06
- (b) Explain how power factor improvement affects saving of energy. 06

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