

B.E. Electrical (Electronics & Power) Engineering (Model Curriculum) Semester-VIII
OEC-4-2 - Electrical Energy Conservation and Auditing

P. Pages : 2

Time : Three Hours



GUG/W/24/14350

Max. Marks : 80

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- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.
 5. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted.
 6. Non programmable calculator is permitted.

1. a) Compare Commercial and Non-Commercial Energy. 8
- b) Explain the challenges and opportunity for Energy Security in India. 8

OR

2. a) What is the Role of Commercial and Non-Commercial Energy Sources in Country's Economy? 8
- b) Explain India's commercial energy production scenario. 8
3. a) Define following terms- 8
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| i) Evaporation | ii) Condensation |
| iii) Moist air | iv) Humidity |
- b) What is the role of capacitors in electrical energy transmission? Comment on selection and location of capacitors. 8

OR

4. a) Define the term power factor, reactive power, active power & load factor. 8
- b) Define the term tariff used in electricity bill? Write a short note on contract demand and maximum demand. 8
5. a) What are the major steps involved in an electrical energy audit? Explain with a suitable example. 8
- b) Define energy management and write down its various objectives. 8

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| 6. | a) | What is benchmarking and what are the parameters for it? What are the permits required for benchmarking and energy performance? | 8 |
| | b) | Write down the various names of instruments required for performing an energy audit and explain how they work? | 8 |
| 7. | a) | A 3-phase, 415 V, 100kW induction motor is drawing 50kW at a 0.75 PF Calculate the capacitor rating requirements at motor terminals for improving PF to 0.95. Also calculate the reduction in current drawn and kVA reduction, from the point of installation back to the generated side due to the improved PF. | 8 |
| | b) | Write a performance assessment of power factor capacitors. | 8 |

OR

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| 8. | a) | What are the factors affecting induction motor performance? | 8 |
| | b) | A 3-phase, 415V, 100kW induction motor is drawing 50kW at a 0.75 PF Calculate the capacitor rating requirements at motor terminals for improving PF to 0.95. Also calculate the reduction in current drawn and kVA reduction, from the point of installation back to the generated side due to the improved PF. | 8 |
| 9. | a) | How to achieve energy efficiency in pumping system. | 8 |
| | b) | What are the types of air compressors, and comment on compressor efficiency? | 8 |

OR

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| 10. | a) | Write details about the Automatic Power Factor Controllers. | 8 |
| | b) | Explain the working of a soft starter and its advantage over other conventional starters. | 8 |
