

M.Tech. First Semester (Membrane & Separation Tech.) (F.T.)
13026 : Advanced Energy Technologies : 1 MST 4

P. Pages : 1

Time : Three Hours



AV - 3378

Max. Marks : 80

- Notes :
1. Answer **any six** question.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Diagrams and Chemicals equations should be given wherever necessary.
 5. Illustrate your answer necessary with the help of neat sketches.
 6. Use of slide rule logarithmic tables, Steam tables, Moller's Chart, Drawing instrument, Thermodynamic table for moist air, Psychrometric Charts and Refrigeration charts is permitted.
 7. Use of pen Blue/Black ink/refill only for writing the answer book.

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| 1. | Explain the following | 13 |
| | 1) Quality Ranking of energy. | |
| | 2) Classification of sources of energy | |
| | 3) Laws of thermodynamics and Carnot efficiency. | |
| 2. | "Chemical Process Industry is Energy intensive but there are energy conservation opportunities (ECO)". Justify. | 13 |
| 3. | What are types of energy audit? Discuss any one in detail with suitable example. | 13 |
| 4. | "Combined heat and power is efficient and effective for large chemical process industries". Discuss with types of systems explain any one in detail. | 13 |
| 5. | What are various hazardous emissions from coal fired thermal plants? Describe the methods of reducing - NOx. | 13 |
| 6. | a) Discuss various Energy storage systems. | 7 |
| | b) State and explain the principle of fuel cell. | 7 |
| 7. | What are methods of harnessing energy from Bio-mass? Discuss its advantages, demerits and applications. | 14 |
| 8. | Explain the principle of photo Voltic cell to convert solar energy into electricity what are other applications of solar energy utilization? | 13 |
| 9. | Discuss the principle, method and applications of wind mills. How is the site selected to harness wind energy? | 13 |
| 10. | Explain in brief: | 13 |
| | i) Geothermal Energy | |
| | ii) Ocean Energy | |
