

III B.Tech I Semester Regular Examinations, November 2006

ENERGY ENGINEERING

(Chemical Engineering)

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. (a) Discuss the recovery of various by products from coke-oven gas using a detailed flow diagram.
(b) What are the important properties of lignite? What are its industrial uses?
[10+6]
2. (a) Describe how desalination of crude is carried out.
(b) What is astabilizer? Explain its role for crude and gasoline. [8+8]
3. (a) What is meant by sweetening.
(b) Explain in detail how natural gas is sweetened. [8+8]
4. Describe the following solar energy storage systems:
(a) Chemical energy storage method
(b) Hydrogen storage [8+8]
5. (a) What are the types of Geothermal fluids?
(b) Explain briefly with a neat sketch about Hot dry rock Geothermal source.
[6+10]
6. Explain the significance and applications of fuel cell. [16]
7. What is phase change material? Explain the various types of phase change material. Explain how phase change materials can store and release energy. [16]
8. Discuss the environmental disasters associated with indiscriminate handling of solid wastes. [16]

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1. (a) Discuss the salient points in transportation of coal from pit-head to the point of utilization.
(b) What is the scope for future development of coal industry. [8+8]
2. In a dual practice of catalytic reforming, instead of one reactor, why more reactors are used? Discuss with reference to catalyst load, percentage of platinum, operating temperature and pressure and extent of conversion in differed reactors. [16]
3. (a) Write about the important tests carried out for diesels?
(b) Discuss the signification of these tests, application point of view? [8+8]
4. (a) Write short notes on heat extraction method from a solar pond.
(b) Write short notes on maintenance of stable density gradient in a solar pond. [8+8]
5. (a) Explain the difference between fixed dome type and floating dome type biogas plant.
(b) Illustrate the dome type biogas plant with a neat sketch. [8+8]
6. What are the unit thermodynamic principles of ideal fuel cell? [16]
7. What is phase change material? Explain the various types of phase change material. Explain how phase change materials can store and release energy. [16]
8. (a) Name different industrial wastes and wastes obtained from a metro city.
(b) How do you utilise these wastes to take care of environmental protection. [8+8]

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1. (a) What is calorific value?
(b) Differentiate gross calorific value and net calorific value.
(c) How is calorific value of coal determined? [4+6+6]
2. (a) Describe a fluidized catalytic cracking unit with a neat schematic.
(b) Write about its merits and demerits over other methods of cracking. [8+8]
3. Describe with a neat flow sheet any sweetening process of gasoline. [16]
4. Describe the various methods of chemical storage of solar energy. Explain them with the help of reactions and examples. [16]
5. Describe with a neat sketch the hydraulic pumped storage ocean energy plant. [16]
6. What are the unit thermodynamic principles of ideal fuel cell? [16]
7. What is phase change material? Explain the various types of phase change material. Explain how phase change materials can store and release energy. [16]
8. Discuss the environmental disasters associated with indiscriminate handling of solid wastes. [16]

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1. (a) Explain in detail high temperature carbonization.
(b) Enlist the product obtained in high temperature carbonization. [10+6]
2. (a) Describe a fluidized catalytic cracking unit with a neat schematic.
(b) Write about its merits and demerits over other methods of cracking. [8+8]
3. (a) What is the composition of natural gas? Why it differs from mine to mine?
(b) What are the inorganic constituents present in natural gas? [8+8]
4. Write about any four applications of solar energy. Explain them with the help of neat schematic diagrams. [16]
5. Write short notes on:
(a) Nuclear fission
(b) Chain Reaction
(c) Moderators
(d) Reactor Control [4+4+4+4]
6. What are the unit thermodynamic principles of ideal fuel cell? [16]
7. Explain the various constructions details of water storage system. [16]
8. Discuss important bio-conversion process for eco friendly municipal wastes. [16]
