Code No: R05310801 **Set No. 1**

III B.Tech I Semester Regular Examinations, November 2008
ENERGY ENGINEERING
(Chemical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Write a detailed note on past and present energy requirements in India?
   (b) Write short notes on thermal capacity and specific heat? [10+6]
2. Write short notes on:
   (a) Black lignite
   (b) Semi Anthracite
   (c) Anthracite
   (d) Boghead coal. [4+4+4+4]
3. (a) Discuss the biogenic origin of petroleum?
   (b) Discuss API gravity and discuss its importance in classification of crude oils? [8+8]
4. What is a fuel cell? What are the limitations? Describe the working of a fuel cell with suitable examples? [16]
5. (a) What is the role of an energy auditor?
   (b) Write about short term, medium term and long term schemes of energy conservation. [8+8]
6. Explain gasification of biomass using gasifiers, with the help of a neat schematic diagram of a gasifier. [16]
7. Write short notes on
   (a) "COP" of a heat pump.
   (b) Thermal recompression of vapour. [8+8]
8. Discuss various energy conservation methods that can be adopted in process industries. [16]

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Code No: R05310801 **Set No. 2**

III B.Tech I Semester Regular Examinations, November 2008
ENERGY ENGINEERING
(Chemical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Write a detailed note on present world wide demand of energy and availability of conventional energy resources? [16]
2. (a) Write short notes on briquetting of solid fuels?
   (b) What are the merits and demerits of using coal as an energy source compared with the conventional liquid and gaseous fuels? [12+4]
3. (a) Define aniline point? Explain how it is measured for an oil sample?
   (b) Give the significance of aniline point with respect to diesel? [8+8]
4. What are natural gas liquids? How are they extracted? Explain with the help of a neat flow sheet? [16]
5. (a) What is the role of an energy auditor?
   (b) Write about short term, medium term and long term schemes of energy conservation. [8+8]
6. Discuss the advantages and disadvantages of horizontal and vertical axis wind mills. [16]
7. Discuss the following heat recovery system in detail:
   (a) Spiral-heat exchanger
   (b) Tubular heat exchangers. [8+8]
8. Give guidelines and recommendations for improving process operations with reference to
   (a) Chemical reactions
   (b) Seperations. [8+8]

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Code No: R05310801 **Set No. 3**

III B.Tech I Semester Regular Examinations, November 2008
ENERGY ENGINEERING
(Chemical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Write the calculations involved in finding out the calorific value using Bomb Calorimeter? Also mention the necessary corrections to be made?
   (b) Write the calculations involved in finding out the calorific value using Boy's Calorimeter? [10+6]
2. (a) Discuss in detail about the storage of coal in industries?
   (b) What is grindability of coal? [10+6]
3. (a) Define aniline point? Explain how it is measured for an oil sample?
   (b) Give the significance of aniline point with respect to diesel? [8+8]
4. What is a fuel cell? What are the limitations? Describe the working of a fuel cell with suitable examples? [16]
5. (a) What is the need for energy audit in a chemical process plant?
   (b) Discuss the two different types of energy audit. [8+8]
6. Discuss Biomass conversion technologies in detail with examples? [16]
7. Discuss the following heat recovery system in detail:
   (a) Spiral-heat exchanger
   (b) Tubular heat exchangers. [8+8]
8. Discuss about various losses in a boiler. How can one reduce these losses to improve the efficiency of the boiler? [16]

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Code No: R05310801 **Set No. 4**

III B.Tech I Semester Regular Examinations, November 2008
ENERGY ENGINEERING
(Chemical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What are the prospects of non- conventional energy sources in India? Explain?[16]
2. Write about coal petrography? Discuss the various petrographic constituents of coal? [16]
3. (a) Define viscosity index? Give its physical significance with respect to application point of view of lube oil?
   (b) What is boiling range? Give the boiling ranges of any two petroleum fractions?
   (c) With reference of fuel oils, write the relation between API gravity and calorific value? [6+6+4]
4. Explain high temperature fuel cells? Specify its applications? [16]
5. (a) What is the role of an energy auditor?
   (b) Write about short term, medium term and long term schemes of energy conservation. [8+8]
6. Discuss the advantages and disadvantages of horizontal and vertical axis wind mills. [16]
7. Write short notes on
   (a) Waste heat boilers-their efficiencies
   (b) Rotary regenerator. [8+8]
8. Discuss various energy conservation methods that can be adopted in process industries. [16]

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