

**BACHELOR OF CHEMICAL ENGINEERING EXAMINATION, 2018**

**(THIRD YEAR FIRST SEMESTER SUPPLEMENTARY)**

**ENERGY ENGINEERING**

Time: Three hours

Full Marks: 100  
(50 marks for each part)

**Use a separate Answer-script for each part**

**Part I**

Answer any TEN questions

10×5

1. Combined cycle power generation using natural gas is a clean and efficient source of power available using fossil fuels. Justify.
2. In a refinery how LPG is separated from off gases? Flowsheet not required.
3. Briefly discuss how shale gas can be extracted from deep within the earth's crust.
4. Briefly discuss the working principle of a nuclear Power Plant. Flowsheet not required.
5. Briefly discuss the working principle of solar photovoltaic cells.
6. Why is freeze protection necessary in solar water heating systems and how this is done?
7. What are the advantages and limitations of wind power?
8. State how a geothermal flash power plant operates. Why the separated liquid is re-injected into the reservoir?
9. Explain how tidal energy can be transformed into electrical energy.
10. Coke at 1100°C is discharged from coke-oven battery. Suggest an efficient way to recover this heat.
11. Discuss the principle of natural draft in a combustion system. Can the combustion air be pre-heated in this case? How?

**B.E.CHEMICAL ENGINEERING EXAMINATION, 2018**

(3<sup>rd</sup> Year, 1<sup>st</sup> Semester Supplementary)

**ENERGY ENGINEERING**

Time: Three Hours.

Full Marks : 100

(50 marks for each Part)

Use separate Answer Script for each Part

**PART II**

Answer any five questions. All questions carry equal marks.

Assume missing data, if any.

- 1 What is the significance of near gravity material (ngm) in coal washing? Describe the operation of a 'Baum jig' for coal washing. 10
- 2 Describe Seyler's coal classification chart (with diagram). What are the advantages and disadvantages of this chart? 10
- 3 Using simplified diagram, briefly describe low temperature carbonisation of coal.
- 4 Why soft coke is not used in Blast furnace? What is the role of limestone in blast furnace? Mention all the reactions that are taking place inside the blast furnace. 10
- 5 Briefly discuss the production of bio-fuel from bio mass through anaerobic digestion
- 6 What physico chemical changes are taking place during carbonisation with temperature?
- 7 What are the compositions of producer gas and water gas? How producer gas is produced? Mention the reactions involved for the production of producer gas. 10