

Printed Pages:02

Sub Code: KOE-033

Paper  
Id:

2	3	3	3	0	2
---	---	---	---	---	---

Roll  
No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**B. Tech.**  
**(SEM III) THEORY EXAMINATION 2022-23**  
**ENERGY SCIENCE AND ENGINEERING**

**Time: 3 Hours**

**Total Marks: 100**

**Note:** Attempt all Sections. If you require any missing data, then choose suitably.

**SECTION A**

**1. Attempt all questions in brief. 2x10 = 20**

- (a) How heat energy can be converted in to mechanical energy.
- (b) Define term entropy.
- (c) Illustrate the term nuclear fission.
- (d) Write down the advantages of nuclear energy.
- (e) Elaborate the principle of solar cell.
- (f) On what factors does the collector efficiency of a solar flat plate collector depend?
- (g) Describe various Geothermal Energy Resources
- (h) Describe various biological energy sources.
- (i) What are the alternatives to deal with energy crisis?
- (j) Discuss the terms Energy conservation and Energy audit

**SECTION B**

**2. Attempt any three of the following: 10x3 = 30**

- (a) Discuss the concept of Quantum. Also describe how quantization of energy takes place.
- (b) Illustrate the concept of nuclear fission reactor design with the help of diagram. Explain PWR type of fission reactor
- (c) Classify different types of solar thermal collector and show the constructional details of a flat plate collector. What are its main advantages?
- (d) Discuss the process of production of biogas from biomass. Describe DeenBandhu Biogas plant.
- (e) Summarize the global warming feature and focus the impacts of this phenomenon on the disturbance to the sustainability of environment.

### SECTION C

3. Attempt any *one* part of the following: 10x1 = 10
- (a) Discuss the main features of various types of renewable and non-renewable energy sources. Also explain the importance of non-conventional energy sources in the context of global warming.
  - (b) Define term radiation. Write down the difference between direct radiation and diffuse radiation.
4. Attempt any *one* part of the following: 10 x1 = 10
- (a) Illustrate the term nuclear fusion? How does it differ from nuclear fission?
  - (b) Discuss the essential features of a hydrogen-oxygen cell. Draw a suitable diagram of this cell and give the reactions took place at the electrodes.
5. Attempt any *one* part of the following: 10x1 = 10
- (a) Write short note on solar cell array.
  - (b) Describe the mechanism of photoconduction in a PV cell.
6. Attempt any *one* part of the following: 10x1 = 10
- (a) Describe the 'Single Basin' and 'Two Basin' systems of tidal power harnessing. Discuss their advantages and limitations.
  - (b) Describe the process of gasification of solid biomass. What is the general composition of the gas produced and what is its heating value? What are its applications?
7. Attempt any *one* part of the following: 10x1 = 10
- (a) Define term green energy? What are the benefits of green energy?
  - (b) Briefly explain the different types of storage systems.