**Printed Pages:02** **Sub Code: KOE-033**

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**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.