PAPER ID-411531

Subject Code: KOE033

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM III) THEORY EXAMINATION 2021-22
ENERGY SCIENCE AND ENGINEERING

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Qno.	Question	Marks	CO
a.	Comment on the statement: "The entropy of the universe tends to be maximum."	2	1
b.	What is the significance of BTU?	2	1
c.	Differentiate between Fusion & Fission nuclear reaction.	2	2
d.	Is the average binding energy of electrons in an atom independent of Z (Number of protons)?	2	2
e.	Describe the operation of a solar cell.	2	3
f.	Discuss the 'latitude angle' and 'Hour angle'.	2	3
g.	Explain warm spring in Geothermal Energy.	2	4
h.	State the limitations of OTEC system.	2	4
i.	Discuss the energy audit and its types.	2	5
j.	What are the alternatives to deal with energy crisis?	2	5

SECTION B

2. Attempt any *three* of the following:

Qno.	Question	Marks	CO
a.	Explain the concept of Quantum. Also describe the concept of Quantization of Energy.	10	1
b.	Illustrate the working principle of Nuclear forces & also outline the different energy scales used in Nuclear Energy.	10	2
c.	Differentiate between N type and P type of semiconductor along with energy band diagram.	10	3
d.	Outline the working principle of tidal power Plant. Discuss their advantages and limitations. Also give present status of tidal power in INDIA.	10	4
e.	Illustrate the short about the following- a) Ways of disposal of nuclear waste fuels. b) Energy crisis	10	5

SECTION C

3. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Illustrate the working of Carnot heat Engines with P-V & T-S diagram.	10	1
b.	Examine the Phase change energy conversion. Describe the different operations of Rankine cycle with the help of diagram.	10	1

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4. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Draw the binding energy curve showing variation of binding energy per nucleon with mass number. With the help of this explain the phenomenon of nuclear fusion and fission & stability concept of nuclei.	10	2
b.	Illustrate the concept of Nuclear fission reactor design with the help of diagram. Explain PWR type of fission reactor.	10	2

5. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Outline the concept of basic physics of semiconductors, Carrier transport, generation and recombination in semiconductors and semiconductor junction.	10	3
b.	Outline the construction and working of solar P-V cell with the help of suitable diagram and also discuss performance curve and conversion efficiency in terms of fill factor of the solar P-V cell.	10	3

6. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Illustrate the concept of a) Fluid dynamics in wind energy conversion. b) Betz law to receive Maximum Energy. c) Effect of number of rotor blades on performance efficiency.	10	4
b.	Analyse the construction, working and limitations of Geothermal Power Plant with the help of diagram.	10	4

7. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Summarize the global warming feature and focus the impacts of this phenomenon on the disturbance to the sustainability of environment.	10	5
b.	Integrate the concept of a) Energy conservation & various principles involved in energy conservation. b) Energy Conservation in illuminating systems. c) LEED Ratings d) Concept of Green Building and Green Architecture.	10	5