



Roll No:

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

BTECH
(SEM III) THEORY EXAMINATION 2023-24
ENERGY SCIENCE AND ENGINEERING

TIME: 3HRS

M.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

Q no.	Question	Marks	CO
a.	What is electromagnetic energy storage?	2	1
b.	Explain the relationship between entropy and temperature.	2	1
c.	Define nuclear binding energy.	2	2
d.	How is quantum mechanics relevant to nuclear physics?	2	2
e.	How solar cell efficiency depends upon temperature?	2	3
f.	What are essential characteristics of solar photovoltaic devices?	2	3
g.	What is ocean thermal energy conversion (OTEC)?	2	4
h.	What factors are considered in wind turbine design?	2	4
i.	Define LEED ratings? What are its utilities?	2	5
j.	What is the purpose of an energy audit for facilities?	2	5

SECTION B

2. Attempt any three of the following:

10 x 3 = 30

a.	Explain the working of internal combustion engine, and what are their main components?	10	1
b.	Explain the concept of nuclear binding energy and its significance in nuclear physics.	10	2
c.	Describe the process of carrier transport, generation, and recombination in semiconductors.	10	3
d.	Illustrate the concept of: (i) Betz law to receive maximum energy. (ii) Effect of number of rotor blades on efficiency.	10	4
e.	Explain the relationship between climate change and energy consumption, highlighting the role of renewable energy in mitigating climate impacts.	10	5

SECTION C

3. Attempt any one part of the following:

10 x 1 = 10

a.	Explain the physics behind power plants, including their types, operation, and efficiency considerations.	10	1
b.	Discuss the significance of phase change energy conversion in various applications, such as refrigeration and energy storage.	10	1

4. Attempt any one part of the following:

10 x 1 = 10

a.	Discuss the safety measures implemented in nuclear fission reactors to prevent accidents.	10	2
b.	Explain the principles of nuclear reactor fuel cycles and their impact on reactor efficiency and waste management.	10	2



PAPER ID-311313

Printed Page: 2 of 2

Subject Code: KOE033

Roll No:

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

BTECH
(SEM III) THEORY EXAMINATION 2023-24
ENERGY SCIENCE AND ENGINEERING

TIME: 3HRS

M.MARKS: 100

5. Attempt any one part of the following: 10 x 1 = 10

a.	Analyze the advantages and limitations of different types of semiconductor materials used in solar cell technology.	10	3
b.	Evaluate the potential of Third Generation Solar Cells in addressing the challenges of efficiency and scalability in solar energy production.	10	3

6. Attempt any one part of the following: 10 x 1 = 10

a.	Explore the concept of biomass energy and its role in both traditional and modern energy systems, including its benefits and limitations.	10	4
b.	Explain the construction, working, and limitation of Geothermal Power Plant with the help of diagram.	10	4

7. Attempt any one part of the following: 10 x 1 = 10

a.	Discuss the significance of embodied energy analysis as a tool for assessing the environmental impact of various products and processes.	10	5
b.	Define the concept of green building and green architecture, and explain how they contribute to energy conservation.	10	5

QP24DP2_143
/ 14-03-2024 13:48:27 | 182.71.247.82