

B.E. ELECTRICAL ENGINEERING THIRD YEAR SECOND SEMESTER EXAM 2024

ENERGY SYSTEMS (HONS.)

Time: Three hours

(50 marks for each part)

Full Marks: 100

Use separate answer script for each part.

PART I

Two marks are reserved for neat and well organised answers

1. a) The per capita energy consumption of a country is an index of the standard of living or prosperity of the people of that country-explain. 4
b) Briefly discuss the importance of Carbon credit. 6
c) Discuss the different modes of operation of tidal project. 4
d) Why is storage of energy necessary? 4
2. Discuss the advantages and disadvantages of conventional and non-conventional energy resources over another. 10

Or

Write short notes on: (i) Nuclear Decommissioning (ii) Green house effect

3. Discuss the different resources for biomass energy generation. 10

Or

Discuss the different types of turbines for tidal power generation.

4. Discuss the principle of operation of pump storage plant. 10

Or

Discuss the present scenario of geothermal energy

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Ref. No. Ex /EE/PE/H/T/327B/2024

B E (ELECTRICAL) 3rd Year, 2nd Sem

EXAMINATION, 20 24

(1st/2nd Semester/Repeat/Supplementary/Spl. Supplementary/Old/Annual/Bi-Annual)

SUBJECT Energy Systems(HONS)

(Name in full)

PAPER

Full Marks 30/ 100

Time : Two hours/Three hours/Four hours/Six hours

(15/50 marks for each part)

Use a separate Answer-Script for each part

No. of questions	Part-I / Part II Answer any three from the following. Two marks for neatness.	Marks
Q1		10+6
a)	With neat diagram explain the principle of wind energy conversion and hence derive the expression for power extracted from wind. Explain the term drag, lift, and angle of attack in case of a wind turbine.	
b)	A Horizontal axis wind turbine has the following data: Speed of wind = 08 m/s at 1 atm and 15°C Diameter of rotor = 100 m Speed of rotor = 40 rpm Calculate the maximum possible torque produced at the shaft.	
Q2		8+8
a)	Explain how the variation of insolation and temperature affects the I-V characteristics of a solar cell.	
b)	What are the different biomass energy resources and what is the energy yield from each of them?	
Q3		8+8
a)	Explain the working of a Geothermal Power Plants. What are the merits and Demerits of geothermal energy?	
b)	What are the basic subsystems of a wind turbine. With neat diagram explain the operation of Horizontal Axis wind Turbine.	
Q4		8+8
a)	Write a note on properties desired for choice of materials for solar cell. Discuss the constraints in photovoltaic Power Generation	
b)	With the help of schematic diagram explain the working of a closed cycle mode Geothermal system	
Q5	Draw and explain in details the following	8+8
	I) Down Draft Gasifier	
	II) Up Draft Gasifier	