B.E. ELECTRICAL ENGINEERING
THIRD YEAR SECOND SEMESTER EXAM 2023

ENERGY SYSTEMS (HONS.)

Time: Three hours | (50 marks for each part) | Full Marks: 100

Use separate answer script for each part.

PART I

Answer **any FIVE** questions.

1. Write a short note on pollutants from coal fired plants. 10

2. Briefly discuss (i) Global warming (ii) Nuclear decommissioning 4+6

3. Discuss the environmental impacts of nuclear power plants. 10

4. Discuss the different types of geothermal resources. 10

5. Discuss the present scenario of biomass energy generation in India 10

6. Briefly discuss the working principle of pump storage plant. 10

7. Discuss different tidal energy conversion schemes 10

8. (i) Discuss the advantages and disadvantages of non-conventional energy resources. 4+6
   (ii) How buying carbon credit can reduce emissions?

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Form A: Paper-setting Blank *Ref. No. Ex* /EE/PE/H/T/326C/2023

B E (ELECTRICAL) 3rd Year, 2nd Sem **EXAMINATION, 20** 23

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

SUBJECT Energy Systems
(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 II Answer any three from the following. Two marks for neatness.	Marks
Q1	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.	10+6
Q2	With the help of block diagram explain the operations of a standalone and grid interactive SPV systems. Explain various type of solar cells based on material thickness and the type of junction structure	10+6
Q3	What do you mean by "cell mismatch" in a solar module and what are their implications. With the help of a block diagram explain the process of working of Hot dry Rock (HDR) resources	8+8
Q4 a)	Sketch the diagram of a Horizontal axis Wind Turbine and explain the functions of of its main components. What .are the effects of solidity on the performance of wind turbine?	8+8
b)	A HAWT has the following data: Speed of wind = 10m/s at 1atm and 15 degree centigrade Diameter of rotor = 120 m Speed of rotor = 40 rpm; Calculate the maximum possible torque produced at the shaft	
Q5	With neat diagram explain the working of updraft and fluidized bed gasifier. What are the advantages and disadvantages of biomass energy?	10+6