Printed Page:- **Subject Code:- AMTME0113**

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech

SEM: I - THEORY EXAMINATION (2022 - 2023)

Subject: Renewable Energy System

Time: 3 Hours **Max. Marks: 70**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **15**

1. Attempt all parts:-

1-a. Which of the following is not a type of primary resource? (CO1) 1

(a) Crude Oil

(b) Coal

(c) Hydrogen Energy

(d) Sunlight

1-b. Which of the following is a reason for storing wind energy? (CO2) 1

(a) Wind power generation is not correlated to the demand cycle

(b) Wind power generation is correlated to the demand cycle

(c) Wind is a renewable resource

(d) Wind power is guaranteed to be available during peak demands

1-c. How is the heat inside earth restored? (CO3) 1

(a) Radioactive decay of elements

(b) Sun restores the heat

(c) Hot steam is pumped into earth

(d) Cosmic rays

1-d. What is the maximum estimated potential of ocean thermal energy conversion per year? (CO4) 1

(a) 80 GWh

(b) 900 MWh

(c) 10000 TWh

(d) 88000 TWh

1-e. Which of the following majorly account for thermal power in India? (CO5) 1

(a) Oil

(b) Solar thermo-mechanical systems

(c) Coal and lignite

(d) Biomass

2. Attempt all parts:-

2.a. What is the purpose of water turbine? (CO1) 2

2.b. Enlist three phases involved in anaerobic digestion for biogas generation. (CO2) 2

2.c. Explain the mechanism of production of local winds. (CO3) 2

2.d. What is energy storage management? (CO4) 2

2.e. Define solar attitude angle. (CO5) 2

SECTION B **20**

3. Answer any <u>five</u> of the following:-

3-a. Write short note about sunshine recorder. (CO1) 4

3-b. Write short note about the sun's declination and hour angle. (CO1) 4

3-c. State the classifications of hydroelectric plants. (CO2) 4

3-d. Mention the factors to be considered for the selection of site for a hydroelectric power plant. (CO2) 4

3.e. Differentiate between batch type biogas plant and Continuous type biogas plant. Which one is more stable and why? (CO3) 4

3.f. Explain the process of commercial production of ethanol from biomass. (CO4) 4

3.g. Explain the major application of wind power (CO5) 4

SECTION C **35**

4. Answer any <u>one</u> of the following:-

4-a. Discuss in brief about biogas and biomass. (CO1) 7

4-b.	Write the important differences between renewable and non-renewable source. (CO1)	7

5. Answer any <u>one</u> of the following:-

5-a.	Explain the various factors to be considered in the selection of a hydraulic turbine. (CO2)	7
5-b.	What the components of the Francis turbine and describe briefly. (CO2)	7

6. Answer any <u>one</u> of the following:-

6-a.	"Bio Energy is very useful for rural applications", justify the statement (CO3)	7
6-b.	With the help of suitable sketch, Explain the process of Pyrolysis. (CO3)	7

7. Answer any <u>one</u> of the following:-

7-a.	What is the principle used in the measurement of speed of the wind? (CO4)	7
7-b.	Explain Vertical Axis Wind Turbine (VAWT). (CO4)	7

8. Answer any <u>one</u> of the following:-

8-a.	What is Kyoto protocol and what are its implications for developed and developing countries. (CO5)	7
8-b.	Explain why it is necessary to develop non-conventional method of generating electrical energy. (CO5)	7