International Islamic University Chittagong

Department of Electrical and Electronic Engineering

B. Sc. Engineering in EEE

Midterm Exam, Autumn 2022

Course Code: **EEE-4843** Course Title: **Renewable Energy System**

Time: 1 hours 30 minutes Full Marks: 30

(i) The figures in the right-hand margin indicate full marks

(ii) Course Outcomes and Bloom's Levels are mentioned in additional Columns

Course Outcomes (COs) of the Questions	
CO1	Understand the need for sustainable development through the knowledge of world energy scenario and energy scenario of Bangladesh.
CO2	Identify problems and providing solutions using RE technologies for the better environmental and social human life.
CO3	Design and demonstrating proficiency in the development of RE-based power system.

Bloom's Levels of the Questions						
Letter Symbols	**R**	**U**	**App**	**An**	**E**	**C**
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

1.	a)	What is meant by sustainable development? How sustainable development is related with renewable energy system integration in power system?	**CO1**	**R, An**	**5**
1.	b)	(i). Define and Explain following terms-(i) Solar Constant (ii) Diffuse and Direct sunlight. (ii). If sun light falling at a 300 angle to the earth, then what will be the effective solar radiation? If these radiation is available at IIUC campus for 12 hours/day then what will be the available peak hours.	**CO1**	**U, E**	**2+3=5**
2.	a)	What is the most effective approach to monitor solar radiation? How does Photovoltaic Pyranometer work? Mention the range of temperature for the low, medium, and high temperature cycle solar thermal system.	**CO2**	**An**	**5**
2.	b)	Find the altitude angle and azimuth angle for the sun at 3:00 P.M. solar time in Boulder, Colorado (latitude 40◦) on the summer solstice.	**CO2**	**E**	**5.**
		Or			
2.	a)	Which solar thermal energy facility is most suited for Bangladesh, and why? How can you fix the problem with the thermal power plant? Compare and contrast active and passive solar design solutions.	**CO2**	**An**	**2+3=5**
2.	b)	Find the direct beam solar radiation normal to the sun's rays at solar noon on a clear day in Atlanta (latitude 33.7◦) on May 21.	**CO2**	**E**	**5**
3.	a)	(i). How Concentrating solar collectors can be used for solar pond? Describe with necessary figure.	**CO2**	**An**	**5**
3.	b)	Design a solar pump system for rural irrigation system with net sketch and describe that how solar pumping system can handle the current load shedding in our agriculture.	**CO2**	**C, An**	**2+3=5**