Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Sixth Semester

ELECTRICAL AND ELCTRONICS ENGINEERING

U18EEE0012: Power Electronics for Renewable Energy System

COURSE OUTCOMES

CO1: Distinguish various renewable energy sources and their significance.
CO2: Describe the concepts of wind and solar energy conversion systems and the concepts of maximum power point tracking algorithms
CO3: Configure the components of grid connected solar and wind energy systems.
CO4: Apply the knowledge on different types of hybrid systems for various applications.
CO5: Choose a power converter for the control of wind, solar and alternate energy systems.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	List few Conventional and Non-Conventional Energy Sources.	CO1	[K1]
2.	Define Fuel Cell and write its two advantages.	CO1	[K1]
3.	Define Solar Constant and write the reasons for variation in solar radiation reaching the earth.	CO2	[K1]
4.	How is the wind caused? Recall the three factors that determine the output of a wind energy converter.	CO2	[K1]
5.	Graphically represent Wind Speed – Power curve.	CO3	[K2]
6.	What are the advantages of using Grid connected PV system?	CO3	[K1]
7.	List various Hybrid renewable energy system configurations.	CO4	[K1]
8.	How is the inverter circuit classified based on commutation circuitry?	CO4	[K1]
9.	Justify the need of power converters for hybrid renewable energy systems.	CO5	[K2]
10.	What is meant by matrix converters?	CO5	[K2]

Answer any FIVE Questions: -
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Explain the prospects of Non-Conventional Energy Sources in India.	8	CO1	[K2]
	b)	With a neat schematic diagram elucidate on Rankine Cycle OTEC plant.	8	CO1	[K2]

12.	a)	Explain with neat diagrams the various Solar radiation measuring instruments.	10	CO2	[K_2]
	b)	Differentiate between Beam and Diffuse Solar radiation.	6	CO2	[K_2]
13.	a)	Illustrate with a neat sketch the construction and working of a Solar Cell.	8	CO3	[K_2]
	b)	Describe with a neat diagram the working of Wind energy conversion system.	8	CO3	[K_2]
14.	a)	Explain the construction and working of PMSG used in wind power conversion.	8	CO4	[K_2]
	b)	Elucidate the various generator control scheme employed to improve grid related concerns.	8	CO4	[K_2]
15.	a)	Explain the different modes of operation of PV fed buck boost converter in detail.	10	CO5	[K_2]
	b)	Draw and explain the block diagram of a battery charging system sourced from a solar panel.	6	CO5	[K_2]
16.	a)	Discuss on Wind-Diesel Hybrid system.	8	CO4	[K_2]
	b)	Interpret the importance of Maximum Power Point Tracking (MPPT) in the operation of a photovoltaic system? Draw its V-I and P-V characteristics Curve.	8	CO2	[K_2]

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