Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL/MAY 2026

Fifth Semester

Electrical and Electronics Engineering

EE3014 - POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS

Regulations - 2021

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BTL*	*CO*	*Marks*
1.	State the limitations of Renewable energy sources.	L1	1	2
2.	List out advantages of fuel cell over conventional power generation methods.	L2	1	2
3.	Outline the Principle of Wind energy conversion.	L2	2	2
4.	Classify the generators used in wind energy conversion systems based on their excitation method.	L2	2	2
5.	Name the factors that affect the Life of the Battery.	L1	3	2
6.	Compare stand alone PV system with grid connected PV system.	L2	3	2
7.	What is meant by controlled rectifier?	L1	4	2
8.	Define PWM inverters and its applications.	L1	4	2
9.	Tell me four Hybrid systems.	L1	5	2
10.	Why Maximum power point tracking used solar panel.	L1	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Explain in detail about the advantages and disadvantages of conventional and non-conventional energy sources, with emphasis on their environmental impacts.	L2	1	16
		Or			
	b	Summarize the working principle of fuel cell with neat sketch and list the types of Fuel Cells.	L2	1	16
12.	a	Determine the construction and Working and principle of Doubly fed Induction generator (DFIG) with relevant expressions.	L5	2	16
		Or			
	b	Prove that performance characteristics of Squirrel Cage Induction Generator (SCIG) with a steady state equivalent circuit model.	L5	2	16
13.	a	Organize the construction and working principle of buck-boost converter with relevant waveforms.	L3	3	16
		Or			
	b	Build with the block diagrams, the operations of stand-alone and grid interactive Solar PV systems.	L3	3	16

14.	a	Analyze the working principle of an AC–DC–AC converter used in wind energy conversion systems. With the help of a neat sketch, explain how each stage-rectification, DC link, and inversion-contributes to variable-speed operation and grid compatibility.	L4	4	16
		Or			
	b	Simplify the construction and working principle of a matrix converter with the help of a neat sketch.	L4	4	16
15.	a	Define Hybrid Energy systems and importance the operating principle of PV-Diesel hybrid system with a neat sketch.	L5	5	16
		Or			
	b	Estimate the various methods to analyze the Maximum Power point tracking.	L5	5	16