

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***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)**

<i>Q.No</i>	<i>Questions</i>	<i>BTL</i>	<i>CO</i>	<i>Marks</i>
1.	Comparison between primary and secondary energy sources.	L2	1	2
2.	What is a major drawback of using petroleum as a fuel?	L1	1	2
3.	List out the main components of a SCIG.	L1	2	2
4.	Why are permanent magnets used in PMSG?	L1	2	2
5.	What is meant by “inversion mode” in line commutated converters?	L1	3	2
6.	Name the software tool used for simulating buck or boost converters.	L1	3	2
7.	Mention the application of a three-phase AC voltage controller.	L1	4	2
8.	How does PWM improve the output waveform of inverters?	L1	4	2
9.	Outline the hybrid energy systems preferred over stand-alone renewable systems.	L2	5	2
10.	Classify the challenge in integrating micro-hydel with PV systems.	L2	5	2

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

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Summarize the significance of non-conventional energy sources in today's energy scenario.	L2	1	8
	ii Illustrate the limitations of conventional energy resources and their environmental impacts.	L2	1	8
	Or			
	b i Contrast the ecological impacts of solar, wind, and hydropower energy.	L2	1	8
	ii Demonstrate the production methods, storage, and applications of hydrogen energy.	L2	1	8
12.	a i Explain the construction and working principle of a Squirrel Cage Induction Generator (SCIG).	L5	2	10
	ii Conclude the advantages and limitations of SCIG in wind power applications.	L5	2	6
	Or			
	b Determine the construction and operating principle of a Permanent Magnet Synchronous Generator (PMSG).	L5	2	16

13.	a	Analyze the operation of a buck-boost converter and explain how it differs from a buck or boost converter.	L4	3	16	
		Or				
	b	Examine the differences between stand-alone and grid-integrated solar PV systems in terms of design, components, and applications.	L4	3	16	
14.	a	i	Apply the construction and working principle of a three-phase uncontrolled rectifier with the help of a neat circuit diagram and waveform.	L3	4	10
		ii	Identify about the stand-alone inverters with grid-interactive inverters in terms of features and applications.	L3	4	6
		Or				
	b	Organize the role of various power converters in renewable energy systems with examples.	L3	4	16	
15.	a	Evaluate the environmental impact of a biomass-diesel hybrid system compared to a pure diesel system.	L5	5	16	
		Or				
	b	justify your design choices and design a basic hybrid energy system for a small village using available resources.	L5	5	16	