

Code No: P18EEE01

HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE  
(AUTONOMOUS)

III B.TECH I SEMESTER END SUPPLEMENTARY EXAMINATIONS, MARCH/APRIL - 2023  
RENEWABLE ENERGY SOURCES  
(EEE Branch)

Time: 3 hours

Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

**PART-A**

Answer all the questions in Part-A (5X2=10M).

Q.No.	Questions	Marks	CO	KL
1.	a) Write any three differences between conventional and renewable energy sources	[2M]	1	
	b) Define collector heat removal factor.	[2M]	2	
	c) Draw the I-V characteristics of a solar cell.	[2M]	3	
	d) What is Betz coefficient?	[2M]	4	
	e) What are the different biomass energy resources	[2M]	5	

**PART-B**

Answer One Question from each UNIT (5X10=50M)

Q.No.	Questions	Marks	CO	KL
UNIT-I				
2.	a) Distinguish between renewable and non-renewable energy sources.	[5M]	1	
	b) Explain beam radiation, diffuse and global radiation with the help of neat sketch.	[5M]	1	
OR				
3.	a) Interpret the reasons for variation in solar radiation reaching the earth than received at the outside of the atmosphere.	[5M]	1	
	b) Calculate solar radiation on tilted surface.	[5M]	1	
UNIT-II				
4.	a) What are the main advantages of flat plate solar collector?	[5M]	2	
	b) Deduce the expression for collector heat-removal factor. List out various parameters that effect the performance of collector.	[5M]	2	
OR				
5.	a) What is a solar still? Draw its diagram and explain its working in detail.	[5M]	2	
	b) Draw a schematic diagram of solar pond based electric power plant with cooling tower and explain its working.	[5M]	2	
UNIT-III				
6.	a) List out various types of Maximum power point techniques. Explain about perturb and observe method.	[5M]	3	
	b) Draw and explain an equivalent circuit of a practical solar PV cell.	[5M]	3	
OR				
7.	a) Derive equation for fill factor from the I-V characteristics of a solar cell and explain the significance of it.	[5M]	3	
	b) Write a short note on sizing of PV system and its storage.	[5M]	3	
UNIT-IV				



8.	a)	Prove that in case horizontal axis wind turbine maximum-power can be obtained when Exit velocity= 1/3 wind velocity. $P_{\max} = (8/27) \rho A V_i^3$	[5M]	4	
	b)	Describe environmental impacts of wind energy.	[5M]	4	
OR					
9.	a)	Sketch the diagram of a VAWT and explain the functions of its main components.	[5M]	4	
	b)	Write a technical note on selection of generator for WECS.	[5M]	4	
UNIT-V					
10.	a)	Compare and contrast the biomass and biogas.	[5M]	5	
	b)	Discuss the energy analysis of a hot Aquifer type Geothermal resource.	[5M]	5	
OR					
11.	a)	Describe the principle of working of a fuel cell with reference to H <sub>2</sub> -O <sub>2</sub> cell.	[5M]	5	
	b)	Derive kinetic energy equation of a tidal power.	[5M]	5	

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