P. F Tin	Pages : ne : Thi	2 ree H	lours	GUG/W/18/10949 Max. Marks : 70
	Note	s:	 All questions carry equal marks. Answer any five questions. Due credit will be given to neatness and adequate dimensions. Assume suitable data wherever necessary. Illustrate your answers wherever necessary with the help of ne Use of Non programmable calculator is permitted. 	at sketches.
1.	a)	Stat	te and explain the nature of wind and origin of wind.	6
	b)	Win	nd at 1 standard atmospheric pressure and 15°c has velocity of 15 m	s. Calculate 8
		i)	The total power density in the wind stream.	
		ii)	The maximum obtainable power density.	
		iii)	A reasonable obtainable power density.	
		iv)	The total power.	
		v)	The Torque and axial thrust. Given :- Turbine diameter = 120m and turbine operating speed = 4 maximum efficiency. Propeller type wind turbine is considered.	0 r.p.m at
2.	a)	Wh	hat are wind farms? How is the planning of wind farm carried out? E	xplain. 6
	b)	Exp	plain the term.	8
		i)	Wind Power Duration Characteristics.	
		ii)	Wind Velocity Duration Curve.	
3.	a)	Wh dyn	nat do you mean by aerodynamic damping and stability and its effect namics?	on power train 7
	b)	Wri	ite a note on Planning of a Wind farm.	7
4.	a)	Des esse	scribe electrical layout of typical wind farm by means of single line ential equipment with their general specification.	diagram. State the 7
	b)	Sho blac	by that $C_P = C_T \ \lambda$, Where C_T is the torque coefficient, λ is the rate de tip speed and Cp is the Betz's coefficient.	io of the outer 7

5.	a)	Write short note on electronic controls used in modern WECS.	7
	b)	Explain in detail which basic aspect's should be considered while selecting the WECS.	7
6.	a)	Explain the process 'Photosynthesis'. What are the conditions which are necessary for it.	7
	b)	What is meant by anaerobic digestion? What are the factors, which affect biodigestion? Explain briefly.	7
7.	a)	What are the techniques suggested for maintaining the biogas production? Explain.	7
	b)	Explain the process 'Photosynthesis' .What are the conditions which are necessary for it.	7
8.	a)	State the merits and demerits of OTEC plants. What are the major problems to be solved.	7
	b)	State the types of Tidal Energy Conversion Scheme.	7
