Form A: Paper-setting Blank   *Ref. No. Ex* /EE/T/424A/2017 ....

.... B E (ELECTRICAL) 4ᵗʰ Year, 2ⁿᵈ Sem .... **EXAMINATION, 20** 17

(1ˢᵗ/2ⁿᵈ Semester/~~Repeat/Supplementary/Spl. Supplementary/Old/Annual/Bi-Annual~~)

SUBJECT .... Energy Systems ....
(Name in full)

PAPER ....

Full Marks 30/ 100

Time : ~~Two hours~~/Three hours/~~Four hours/Six hours~~   (~~15~~/50 marks for each part)

Use a separate Answer-Script for each part

No. of questions	Part I Answer any three from the following. Two marks for well organized answers.	Marks
Q1 a)	With neat diagram explain the principle of wind energy conversion and hence derive the expression for power extracted from wind. Explain the term drag, lift, and angle of attack in case of a wind turbine.	10+6
b)	What do you mean by cell mismatch in a solar module and what are its implications?	
Q2 a)	Sketch the diagram of a Horizontal axis Wind Turbine and explain the functions of of its main components. What .are the effects of solidity on the performance of wind turbine?	10+6
b)	What are the different biomass energy resources and what is the energy yield from each of them?	
Q3 a)	With neat diagram explain the working of a up- draft or counter current gasifier.	10+6
b)	Sketch the diagram for a Close cycle mode operation of a Ocean Thermal Energy Conversion system and hence explain its operation.	
Q4 a)	Determine the expression to deduce efficiency of a fuel cell.	10+6
b)	With respect to solar photovoltaic cell, with the help of I-V characteristic plot, explain the following term a) Open circuit voltage b) Short circuit current	
Q5	Explain in details the following I) Various types of geothermal resources II) Classify different types of fuel cell	8+8

[Turn over

Bachelor of Electrical Engineering, 2017

(4th Year, *2nd* Semester .)

Energy Systems

Time: Three Hours

Full Marks: 100

(50 marks for each part)
Use a separate Answer-Script for each Part

PART-II

Answer *any three* questions from this part.
Two marks are reserved for neat and well organised answer

1.	a)	Discuss the different methods of extraction of coal.	4
	b)	Mention the different uses of coal.	4
	c)	List the characteristics of different types of coal.	4
	d)	Mention the distillation products of coal gas.	4
2.	a)	Discuss thermal energy storage devices.	8
	b)	Describe the different types of mechanical energy storage device.	8
3.	a)	Discuss the prospects of world biodiesel market. Highlight the barriers encountered in the growth of biodiesel market.	8
	b)	Describe the different generations of biofuels.	8
4.	a)	What do you know about abiogenic theory regarding the origin of fossil fuels?	4
	b)	Compare the performance of fuel cell electric vehicles with conventional ICEs.	6
	c)	Discuss methane hydrates as nonconventional fossil fuels.	6
5.	a)	List some general principles of energy conservation.	8
	b)	What is the run of the river hydroelectric station and tidal power station?	4
	c)	Mention the applications of solar power in agricultural sector in India.	4