GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

RN190012283

Registration No: | | | | | | | | | | |

Total Number of Pages : 2 AR-17 B.TECH

B.TECH 5th SEMESTER EXAMINATIONS, NOV/DEC 2019

BELOE5051 – RENEWABLE ENERGY SOURCES

Common to CSE,IT and MECHANICAL ENGINEERING BRANCHES

Time : 3 Hours Maximum : 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) 10 x 2=20 Mark

Q.1. Answer *All* Questions

a	The value of Solar Constant is a) 1347 W/m^2 b) 1357 W/m^2 c) 1367 W/m^2 d) 1377 W/m^2	CO1 PO3
b	The ratio of the beam radiation flux falling on a tilted surface to that falling on a horizontal surface is called the a) Radiation shape factor b) Tilt factor c) Slope d) Elevation	CO1 PO3
c	Installed wind power potential in India as on the first quarter of 2019 is around a) 26 GW b) 36 GW c) 46 GW d) 56 GW	CO2 PO2
d	The wind intensity can be described by a) Reynolds number b) Mach number c) Beaufort number d) Froude number	CO2 PO2
e	Which force is responsible for forcing the global winds towards westerly direction? a) Coriolis b) Gravitational c) Centripetal d) Centrifugal	CO2 PO2
f	The percentage of carbon dioxide in the bio methane is in the range of a) 10-20 b) 20-30 c) 30-40 d) 40 - 40	CO3 PO1
g	The region where the electrons and holes diffused across the junction is called as a) Depletion Junction b) Depletion region c) Depletion space d) Depletion boundary	CO1 PO3
h	What is the purity of bio ethanol obtained through fermentation process? a) 98.9% b) 99.2% c) 99.4% d) 99.7%	CO4 PO1
i	What is the type of energy stored as latent heat a) Thermal energy b) Chemical energy c) Electrical energy d) Mechanical energy	CO4 PO1
j	Which of the following is not a requirement for site selection of hydroelectric power plant? a) Availability of water b) Large catchment area c) Rocky land d) Sedimentation	CO3 PO1

PART – B: (Short Answer Questions) 10X2=20 Marks

Q.2. Answer *ALL* questions

a	State the necessity for harnessing power from renewable energy sources?	CO1 PO3
b	What is the need for maximum power point tracking?	CO1 PO3
c	What is Greenhouse effect?	CO1 PO3
d	What is the significance of thermal energy storage in solar energy systems?	CO1 PO3
e	Define tip speed ratio and state its significance.	CO2 PO2
f	What are the reasons for the tall tower for horizontal axis wind turbines?	CO2 PO2
g	What are the factors affecting biogas generation?	CO4 PO1
h	Differentiate pyrolysis and gasification.	CO4 PO1
i	List out different types of energy storage.	CO4 PO1
j	State the implications to commercialize the electric vehicles in India?	CO3 PO1

PART – C: (Long Answer Questions) 4X15=60 Marks

Answer *ALL* questions

Q.3			
a	Explain about the impact of conventional energy sources.	7	CO1 PO3
b	Describe the features and importance of distributed energy systems.	8	CO1 PO3
	OR		
c	Explain the working of solar water pumping system with a neat sketch.	7	CO1 PO3
d	Distinguish the types of solar collectors and explain the characteristics of collectors with neat diagram.	8	CO1 PO3
Q.4			
a	Explain the components of wind energy conversion systems.	7	CO2 PO2
b	Derive the Betz's wind turbine efficiency limit.	8	CO2 PO2
	OR		
c	Explain the major three mechanical controls of wind turbine.	7	CO2 PO2
d	Wind at 1 standard atmospheric pressure and 15 °C has a velocity of 15 m/s. Wind turbine has 120 m diameter and its operating speed is 40 rpm at maximum efficiency. Calculate the following: i. the total power density in the wind stream ii. the maximum obtainable power density iii. reasonably obtainable power density iv. the total power v. the torque vi. the axial thrust	8	CO2 PO2
Q.5			
a	Explain the operation of biogas digester plant with floating drum?	5	CO4 PO1
b	Discuss about updraft and downdraft gasifier with a suitable sketches.	10	CO4 PO1
	OR		
c	Explain the pyrolysis process?	7	CO4 PO1
d	Discuss the steps involved in production of biodiesel.	8	CO4 PO1
Q.6			
a	Explain the wind and solar PV hybrid systems?	7	CO3 PO1
b	Discuss on hybrid micro-hydel and solar PV systems?	8	CO3 PO1
	OR		
c	Explain about various grid connection issues and its impact on system stability?	7	CO3 PO1
d	Discus about hybrid electric vehicle.	8	CO3 PO1

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