Code No: 128ED

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, May - 2019
RENEWABLE ENERGY SOURCES
(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a)	Define what is Solar constant.	[2]
b)	Differentiate terrestrial and extra terrestrial radiation.	[3]
c)	List out the advantages of renewable energy sources.	[2]
d)	How photovoltaic energy is different from conventional electric energy from generation point of view.	[3]
e)	What is the difference between aerobic and anaerobic digestion?	[2]
f)	What are the advantages of vertical axis wind turbine?	[3]
g)	List out the types of geothermal wells.	[2]
h)	What is the principle of OTEC?	[3]
i)	What are the limitations of Carnot cycle?	[2]
j)	What are the features of Carnot cycle?	[3]

PART - B
(50 Marks)

2.a) Explain the importance of renewable energy sources and their potential in Indian energy sector.
b) Explain the working of Sunshine recorder with the help of a neat sketch. [5+5]

OR

3.a) Give an over view of conventional and non conventional sources of energy sources with reference to India.
b) Explain following angles used in solar radiation analysis:
i) Latitude of location
ii) Hour angle
iii) Solar azimuth angle
iv) Zenith angle
v) Declination angle. [5+5]

4.a) Explain the working of solar air heating process.
b) Describe briefly the principle of working of a cylindrical parabolic concentrator with a neat sketch. [5+5]

OR

5.a) List out the differences between flat plate collector and concentrated collector.
b) Explain the working of a solar distillation system with a neat sketch. [5+5]

6.a) Discuss the performance characteristics of Horizontal axis wind turbine.

b) Explain the process of production of Bio-gas from bio-mass, what are the main advantages of anaerobic digestion of biomass. [5+5]

OR

7.a) Discuss various biomass resources used for production of biomass energy.

b) Calculate the volume of cow dung based biogas plant to meet cooking requirement of five persons (230 per day) and lighting of three 100CP mantle lamps consuming 120 per hour for 3 hours. Also, calculate the required number of cows to run the plant in case cow dung produced is 1 kg/day and collection efficiency is 70%, percentage of solid is 16% and production of gas from solid is 340 per kg. [5+5]

8.a) Classify geothermal energy harnessing techniques and explain the working of hot dry rock geothermal source power plant

b) A deep ocean wave of 2 m peak appears at a speed of 8s. Find the wave length, phase velocity and power associated with the wave. At this power rate what is the average annual wave energy in MWh/m. [5+5]

OR

9.a) Describe various energy extraction technologies used with hydrothermal resources.

b) Describe the working of open cycle OTEC plant .What are the advantages and disadvantages of OTEC plant. [5+5]

10.a) What is need for DEC?

b) Explain the basic principles of a magneto hydrodynamic power (MHD) conversion system. [5+5]

OR

11.a) Write a short note on:
i) Seebeck, Peltier ii) Fuel cells

b) Explain the Carnot cycle. [5+5]

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