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Total Number of Pages : 02

B.Tech.
PEL5J001

5th Semester Regular Examination 2017-18

Renewable Energy Systems

BRANCH: EEE

Time: 3 Hours

Max Marks: 100

Q.CODE: B405

Answer Question No.1 and 2 which are compulsory and any four from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: *multiple type or dash fill up type* (2x10)

- Which year is said to be starting point for large scale planning of renewable energy globally?
(I)1973 (II)1942 (III)1850 (IV) 1991
- What is the standard value of solar constant?
(I)1KW m² (II)1.367KW m² (III)1.5KW m² (IV) 5KW m²
- At solar noon, the hour angle is?
(I)+90⁰ (II)-90⁰ (III)Zero (IV) -180⁰
- The value of concentration ratio of a flat plate collector is
(I)1 (II)10 (III)100 (IV) 1000
- What is the typical cooking time of a paraboloidal dish cooker?
(I)2-3 hours (II)20-30 minutes (III)20-30seconds (IV) 6-12hours
- The efficiency of a commercial solar cell lies in the range
(I)0-10% (II)10-20% (III)20-30% (IV) 50-60%
- A typical open circuit voltage of a solar cell is
(I)12V (II)6V (III)3V (IV) 0.5V
- The energy payback period of wind equations is
(I)1Year (II) 2Year (III) 3Year (IV) 4Year
- The optimum solid concentration in a biogas is
(I)37-39% (II)27-29% (III)17-19% (IV) 7-9%
- Storage of biomass energy is
(I)Very difficult (II) Inbuilt difficult (III)Expensive (IV) Impossible

Q2 Answer the following questions: *Short answer type* (2x10)

- What is meant by renewal energy sources?
- Which is the most expensive component of a solar PV system?
- What factors led to accelerate development of wind power?
- What are the advantages of biogas energy?
- What are the green house gases?
- Name three collectors requiring one-axis sun tracking.
- What is solar house?
- Describe an expression for energy available in the wind?
- What do you understand by gust?
- Differentiate between wind-diesel hybrid system and wind PV hybrid system?

Q3

- Discuss main features of non conventional energy sources? (10)
 - Discuss and difference between decentralized and dispersed generation? (5)
- What are the environmental impacts of geothermal energy? (5)

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- Q4 a)** i) Describe flat plate collector with the help of a suitable diagram. **(10)**
ii) Write the advantages and disadvantages of concentrating collector over flat plate types solar collectors.
- b)** How does sun tracking help in energy collection by a flat plate collector. **(5)**
- Q5 a)** i) Describe the principle of solar photo voltaic energy conversion system. **(10)**
ii) What is the importance of MPPT in a solar photo voltaic system?
- b)** Describe about Stand-Alone Solar PV System. **(5)**
- Q6 a)** i) With the help of diagram, discuss the power versus wind- speed characteristic of a wind turbine. **(10)**
ii) With the help of block diagram, explain the functions of various blocks of a WECS.
- b)** Draw and explain an equivalent circuit of a practical solar PV cell. **(5)**
- Q7 a)** i) What is biomass? What are the different resources used to extract biomass energy? **(10)**
ii) What are the main advantages of anaerobic digestion of biomass?
- b)** Explain the mechanism of production of local winds. **(5)**
- Q8 a)** i) Describe about distributed energy systems. **(10)**
ii) How reactive power compensation is done?
- b)** What are the factors affecting the performance of a biogas digester? **(5)**
- Q9 a)** Discuss different types of hybrid systems. **(10)**
b) Differentiate between wind diesel hybrid system and wind PV hybrid system. **(5)**
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