

**B.TECH. SEM -VI ELECTRICAL 2014 COURSE (CBCS) :**  
**SUMMER - 2018**  
**SUBJECT : ELECTIVE – II : RENEWABLE ENERGY SYSTEMS**

Day : **Monday**  
Date : **11/06/2018**

**S-2018-2417**

Time : **02.30 PM TO 05.30 PM**  
Max. Marks : 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.

**Q.1** Discuss the factors favouring and against renewable energy sources. [10]

**OR**

Discuss in brief prototype carbon funds (PCF), concept of carbon credits and carbon foot prints. [10]

**Q.2 a)** What are the characteristics of wind? State the advantages and disadvantages of wind energy. [05]

**b)** Give the comparison between horizontal and vertical axis wind machines. [05]

**OR**

The following data relate to a wind turbine: [10]

Velocity of wind at 15°C = 10 m/s;

Turbine diameter = 10 m;

Operating speed of the machine = 35 rpm at maximum efficiency of 40%.

Calculate:

- i) The total power density in wind stream.
- ii) The maximum power density.
- iii) The actual power density.
- iv) The power output of the turbine.
- v) The axial thrust on the turbine structure.

**Q.3** Describe flat plate collector with neat diagram, materials for flat plate collectors. State the applications, advantages and disadvantages of flat-plate collectors. [10]

**OR**

Compute the monthly average hourly solar flux received on a flat – plate collector facing due south ( $\gamma = 0^\circ$ ) having a slope at  $12^\circ$ . The collector is located at a place  $15^\circ 00' N$  on 20<sup>th</sup> day of October. The data given are:

Time 11:12 h (local apparent time)

Hg = 2408 kJ/m<sup>2</sup>/h

Hd = 1073 kJ/m<sup>2</sup>/h.

Ground reflectivity,  $\rho = 0.25$ ,  $\omega = 7.5^\circ$ .

**P.T.O.**

**Q.4 a)** Write requirements for installation of Grid connected system (like technical survey, area,) [05]

**b)** Write a short note on solar cars. [05]

**OR**

**a)** Compare monocrystalline and thin film PV cells. [05]

**b)** Write a note on scope of growth of solar PV systems in rural India. [05]

**Q.5 a)** Write a short note on clean coal power plant technology. [05]

**b)** How energy is generated by municipal solid waste. [05]

**OR**

**a)** Write short note on : [05]

**i)** Micro & **ii)** Mini hydro power stations

**b)** Design system for your residency / home town. Give area, type of home (own, society, quarters etc.) and details about system. [05]

**Q.6 a)** Design a battery set up for 3kW roof top solar system. [05]

**b)** Write a short note on hydrogen storage. [05]

**OR**

**a)** Give different types of batteries. Explain maintenance and management. [05]

**b)** Enlist the various energy storage systems and their uses in renewable energy sources. [05]

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