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

**Total Number of Pages: 02**

**Course: BTech**
**Sub Code : REL5D005**

**6th Semester Regular/Back Examination: 2022-23**
**Renewable Power Generation Systems**
**AG, AE, BIOTECH, CIVIL, ELECTRICAL&CE, ELECTRONICS & CE, ETC**
**Time: 3 Hour**
**Max Marks : 100**
**Q. Code: M138**

**Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.**
**The figures in the right-hand margin indicate marks.**

**Part-I**

**Q1** **Answer the following questions:** **(2 x 10)**

**a)** Briefly explain: Distributed Generation.

**b)** Briefly explain partial shading effect in solar PV cells.

**c)** State the working principle of a Solar Cooker.

**d)** Briefly explain, DFIG.

**e)** What will be the power output of a wind electric generator when the wind speed is increased by 4 times? Explain.

**f)** State the advantages of a Horizontal axis Wind turbine.

**g)** What is known as Pyrolysis?

**h)** What is Bio-diesel? Briefly explain.

**i)** State the advantage of a Biomass-Diesel system.

**j)** What are the merits of hybrid renewable power systems?

**Part-II**

**Q2** **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 × 8)**

**a)** Explain MPPT method with an example.

**b)** Explain the current–voltage characteristic of solar cell. Also define the fill factor.

**c)** Write a short note on Solar desalination systems.

**d)** What is solar time and why is it different from the standard clock time of a country?

**e)** Wind speed is 10 m/s at the standard atmospheric pressure. Calculate (i) the total power density in wind stream, (ii) the total power produced by a turbine of 100 m diameter with an efficiency of 40%. Air density = 1.226 J/kg.K/m3.

**f)** What do you mean by pitch angle? How pitch angle can be controlled in wind energy conversion system?

**g)** Why reactive power compensation is required in wind firms and how is it provided? Explain.

**h)** Explain in brief the challenges and function of a wood gassifier.

**i)** Explain the construction and working principle of Peltier Cooling.

**j)** Write a short note on Anaerobic digestion and explain its merits and demerits.

**k)** Explain various types of electric and hybrid electric vehicles.

**l)** Explain the construction and working principle of a double output wind conversion system with a neat diagram.

## Part-III

**Only Long Answer Type Questions (Answer Any Two out of Four)**

**Q3** Draw and explain an equivalent circuit of a practical solar PV cell. Explain about Solar PV Module, Solar PV Panel and Solar PV Array. **(16)**

**Q4** Explain the construction and working principle of a double output wind conversion system with a neat diagram. Also discuss its merits and demerits. **(16)**

**Q5** Describe the construction and working principle of a biomass power plant. Briefly explain the issues and challenges in generating power from biomass. **(16)**

**Q6** **(a)** Discuss the working of Microhydel-PV hybrid power system. Discuss the challenges when it operated in isolated and grid connected modes. **(8)**

**(b)** Write a short note on Diesel-PV and Wind-PV System. **(8)**