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Total number of printed pages – 2

B. Tech
PEEL 5302

Fifth Semester (Back/ Special) Examination – 2013

RENEWABLE ENERGY SYSTEMS

BRANCH : EEE, ELECTRICAL

QUESTION CODE : D 331

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which are compulsory and any **five** from the rest.

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10
- (a) What is green power ?
- (b) Write two advantages and disadvantages of conventional energy sources.
- (c) What is teetering of rotor ?
- (d) What is Betz limit ?
- (e) What is Peltier cooling ?
- (f) What are different types of hybrid electric vehicle ?
- (g) What are the advantages of diesel pv systems?
- (h) What is solar energy system ?
- (i) Write combustion engine application.
- (j) What is microhydel power plant ?
2. (a) Derive the efficiency limit for wind energy conversion. 5
- (b) Write down the difference between HAWT and VAWT. 5
3. (a) Differentiate between floating drum and fixed dome type bio gas plant with suitable diagram. 5
- (b) Write about wind photo voltaic systems with suitable diagram. 5

P.T.O.

4. (a) Write down the details about municipal solid waste incineration plant with suitable diagram ? 5
- (b) Write down the process of fermentation of anaerobic digester. 5
5. (a) Write down different types of Solar collectors, performance characteristics. and application. 5
- (b) Write down Solar processes and spectral composition of solar radiation. 5
6. (a) A HAWT has following data :
 Speed of wind-10 m/s at 1 atm and 15° C
 Diameter of rotor = 120 m
 Speed of rotor = 40 rpm
 Calculate maximum possible torque produced by shaft. 5
- (b) Draw neat diagram of HAWT and explain its component. 5
7. The following hourly values are measured between 11.00 to 12.00 :
 Hours on a clear day on april at Bhubaneswar (21° 15' N, 85° 52' E)
 Global radiation = 3196.8 KJ/m²-h
 Diffuse radiation = 745.28 KJ²/m²-h
 Using empirical relations, estimate global and diffused radiation and compared with the measured data. 10
8. Write short notes any **two** of the following : 5×2
- (a) Wood stove
- (b) Bio diesel
- (c) Pyrolysis.

