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APR-MAY 2022

B. E. (Eighth Semester) Examination, ~~2020~~

(New Scheme)

(AEI, Bio Tech, Chem., Civil, CSE, Elect. EEE, EI, ET & T, IT, Mech., Mining, Metallurgy, Mechatronics, Prod., Automobile Engg. Branch)

NON CONVENTIONAL ENERGY SOURCES

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Part (a) is compulsory for each unit. Solve any two from part (b), (c) and (d).*

Unit-I

1. (a) Define energy and write names of its types. 2

(b) What is the need of shifting towards non conventional energy sources. Explain with suitable example. 7

(c) Enumerate different energy storage methods and explain their advantage and disadvantage. 7

(d) Discuss various types of energy conservation methods. 7

Unit-II

2. (a) Define Solar Constant. 2

(b) Draw the V-I characteristics of photo-voltaic (PV) module. Explain the effect of temperature on performance of module. 7

(c) Describe the working of Grid connected photo voltaic system. What are limitation of photovoltaic system. 7

(d) Draw the schematic diagram of solar thermal power plant. Explain the working of solar central receiver type power plant. 7

Unit-III

3. (a) Define power coefficient of wind turbine. 2

(b) What factors are considered in site selection for wind power plant? Discuss limitation of wind energy conversion. 7

(c) What is Aerofoil in wind power generator. Write and explain different types of it. 7

(d) A propeller type horizontal wind turbine having following characteristics : Air density = 1·226 kg/m^3. Speed of wind 10 m/s, at 1 atm and 15°C. Turbine has diameter of 120 m and its operating speed is 40 rpm at maximum efficiency. Calculate : 7

(i) Total power density in wind stream

(ii) Max. obtainable power density assuming $\eta = 40\%$.

(iii) Total power produced (in kW)

Unit-IV

4. (a) What are different sources to GEO thermal energy? 2

(b) Draw the schematic diagram of geo thermal power plant. Explain its working. 7

(c) What are different components of a tidal plant? Explain operation of plant. 7

(d) What are different biomass conversion process? Classify different types of plants used for those process. 7

Unit-V

5. (a) Write advantages of MHD generation. 2

(b) Describe the principle of MHD power generation. 7

(c) What are limitations of thermionic conversion system. Justify with example. 7

(d) Enumerate different methods for production of Hydrogen to be used in energy conversion unit. 7