Renewable Energy Resources

Full Marks: 15   Time: 1 Hour

The figures in the margin indicate full marks.
Candidates are instructed to write the answers in their own words as far as practicable.

3x5=15

Answer any _three_ questions

1. Classify geothermal energy resources based on *i)* geothermal energy available areas and *ii)* geothermal energy recovery systems.   5

2. i)   What is Biomass?   1
   ii) Make a brief comparison between Floating-Drum and Fixed-Drum type biogas plant.   4

3. Make a comparison between Conventional energy and Renewable energy.   5

4. Determine *i)* Power available in the wind (P_W), *ii)* Power extracted by the turbine (P_T) and *iii)* Power Coefficient (C_P) from the following data: rotor diameter is 70m, air density is 1.23 kg/m^3, upstream wind velocity is 15m/s, downstream wind velocity is 60% of free wind.   5

5. Determine *i)* Local Apparent Time [Solar time], *ii)* Declination angle (δ), *iii)* Hour angle (ω) corresponding to 11.00 hour (IST) at Jalpaiguri (26.5^0 N, 89^0 E) on 13th May. Indian standard time is based on 82.5^0 E. Consider Equation of Time Correction as ($-$) 4 minutes.   5

Turbo Machinery

Full Marks: 15   Time: 1 Hour

The figures in the margin indicate full marks.
Candidates are instructed to write the answers in their own words as far as practicable.

3x5=15

Answer any *three* questions

5

1. Derive the governing Euler equation for a turbine or pump.   5
2. Differentiate between impulse and reaction turbine.   5
3. Prove that Degree of reaction for Francis turbine is $R = 1 - \frac{\cot\alpha}{2|\cot\alpha - \cot\theta|}$ where is α nozzle angle and θ is

    vane angle at entry.   5

4   Derive specific speed of a turbine $N_S = \frac{N\sqrt{P}}{H^{5/4}}$ where H is head, P is power, and N is rpm.

5. Explain terms flow coefficient, head coefficient and power coefficient   5

JALPAIGURI GOVT. ENGINEERING COLLEGE

Industrial Engineering (OE-ME801A)

Answer any three :

1. What is the purpose of carrying out work study? What do you mean by 'therbligs' ? 3 + 2

2. State the principles of motion economy related to use of human body and arrangement of work place. 2.5 x 2

3. The table below shows the demand for a particular product of the last twelve months.

1	2	3	4	5	6	7	8	9	10	11	12
12	15	19	23	27	30	32	33	37	41	49	58

(i) Compute the monthly demand forecast for months 5 to 12 using a 4 month moving average method. What would be your demand forecast in month 13 ?

(ii) Use exponential smoothing with a smoothing constant of 0.2 to compute the demand forecast for the month 13.

4. Define production planning and control (PPC). State the functions of PPC .

Jalpaiguri Government Engineering College

Class Test **B.Tech** **Automobile Engineering** **8th Sem** **Full Marks: 15** **Time: 1 hour**

(PE-ME801A2)

Group A (Answer any five)   2x5 = 10

1. Define stoichiometric fuel-air (F/A) ratio.

2. Draw the layout of forced fuel feed system.

3. Write a short note on camber.

4. What is the necessity for multiple gears in an automobile?

5. What do you mean by traction effort?

6. Write in brief about lean and rich mixtures of F/A ratio.

Group B   1x5 = 5

7. a. Illustrate the working principle of carburetor.

Or

b. Illustrate the working principle of simple differential with neat diagram.