SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | | **Total number of pages:[2]**

Total number of questions:06

B.Tech. || All || 5th Sem

New & Renewable Energy Sources

(RP)

Subject Code: BTCH-904A

Paper ID: M|18 (2015 batch)

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**

PART A (2marks x 10)

Q. 1. Short-Answer Questions:

(a) What is meant by renewable energy source? List the various renewable energy sources.

(b) What is the difference between beam and diffuse radiation?

(c) Give the working principle of pyranometer.

(d) What is the reason for placing the solar collectors as south facing? Is it applicable for any part of world?

(e) State any two disadvantages of flat plate collectors.

(f) Sketch a mini hydel plant.

(g) What is Yaw control and Yaw active systems?

(h) How can the solar energy be stored?

(i) Sketch the velocity duration, power duration and frequency duration curves..

(j) What is meant by isodynes and isovents?

PART B (8marks x 5)

Q. 2. a) Discuss the energy scenario of India. Why is the renewable energy important for India? CO1, CO2

b) Sun is the source of all energy. Elaborate.

OR

a) Classify the various renewable energy sources. Discuss about any two of them. CO1, CO2

b) The use of renewable energy sources will reduce environmental pollution. Comment.

Q. 3. a) What are aero generators and their types? Explain the operation of one wind turbine in detail. CO3

b) Discuss about the availability of wind energy and its measurement.

OR

a) What is anaerobic and aerobic digestion? Elaborate anaerobic digestion with reactions involved. CO3

b) Elucidate the operation of biodigestors.

Q. 4. Discuss about the photovoltaic systems in detail including the principle and working. What are its advantages and disadvantages? CO4

OR

a) How is the hydroelectricity generated? Explain. What are its disadvantages? CO4

b) What is the source of geothermal energy? How can it be harnessed? Elaborate on geothermal wells.

Q. 5. Calculate the solar radiation received on a horizontal surface on April 23 at a location at latitude 10°N. Given a = 0.30, b=0.51, n/N=0.55, $\delta = 10^{\circ}$,where the symbols have their usual meaning. CO4

OR

List the various solar energy collectors. Describe in detail the working of any two concentrating solar collectors with neat diagrams. What are the advantages and disadvantages of focusing collectors? CO4

Q. 6. What is meant by bio-diesel and bio-ethanol? Explain the production of one of them with the reactions involved. CO3

OR

a) Explain the open cycle OTEC system. What are its disadvantages? CO3

b) With a neat block diagram, explain the operation of aero generators and elaborate on its components and their interlink.