



R18 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code: 205BD

B.Tech V Semester Regular/Supplementary Examinations, December 2021
NON-CONVENTIONAL POWER GENERATION
(Electrical and Electronics Engineering)

Maximum Marks: 70

Date:08.02.2022 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 What is meant by solar spectrum?
- 2 What are solar ponds?
- 3 What are the basic components of Photovoltaic systems?
- 4 Explain the importance of solar tracking?
- 5 What is the efficiency of a wind turbine?
- 6 What are the advantages and disadvantages of wind turbines?
- 7 What is the difference between biomass and biogas?
- 8 Explain the factors that affect bio digestion?
- 9 What the applications of fuel cells?
- 10 Explain the types of electrodes?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 a) What are the losses affecting the efficiency of flat plate collector? Explain how do you reduce the same? [5M]
b) Explain any one solar radiation measuring instrument with a neat sketch. [5M]
- OR
- 12 a) Explain the industrial applications of solar ponds and solar heating / cooling techniques. [5M]
b) How solar radiation effect on tilted surface? [5M]
- 13 a) What is Maximum Power Point Tracker (MPPT)? Explain the possible strategies for operation of a Maximum Power Point Tracker. [5M]
b) With a schematic diagram, describe the working of a basic photovoltaic system for power generation? [5M]
- OR
- 14 a) Discuss in detail about the solar thermo electric conversion. [5M]
b) Why Tracking is needed and what advantage does MPPT give in the real world? [5M]

- 15 a) Discuss the advantages and disadvantages of both horizontal and vertical axis wind mill? [5M]
b) Discuss about the classification and applications of wind energy conversion systems? [5M]

OR

- 16 a) Using Betz model of a wind turbine, derive the expression for power extracted from wind? [5M]
b) Explain in detail about the aerodynamics of wind turbine? [5M]

- 17 a) Explain wet and dry processes? [5M]
b) Explain Magna resources? [5M]

OR

- 18 a) List out the factors affecting the generation of biogas? [5M]
b) Explain in detail about anaerobic digestion and the different phases and the processes involved in it? [5M]

- 19 a) What is the significance of a fuel cell? Write short notes on regenerative fuel cell and list out its advantages. [5M]
b) Distinguish between working principles of a single basin and double basin systems of tidal power plants. [5M]

OR

- 20 a) Explain the construction and working of Lead acid battery. [5M]
b) Explain the principle of operation of OTEC systems? What is the necessity of setting OTEC plants? [5M]