|  |  |  |  |
| --- | --- | --- | --- |
| **R20 Regulation Subject Code: C580E2**  **TKR COLLEGE OF ENGINEERING & TECHNOLOGY**  **(Autonomous, Accredited by NBA& NAAC with ‘A+’ Grade)**  **B.Tech. VIII Semester Regular Examinations, March-2024**  **Model Paper -1**  **Renewable Energy Systems**  ***CSE-DATA SCIENCE***  ***Maximum Marks: 70 Date: 20.03.2024, Duration 3 Hours*** | | | |
| **Note:** **1.This question paper contains two parts A and B.**  **2. Part A is compulsory which carries 10 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** | | **CO** | **BTL** |
| **All the following questions carry equal marks (10x2M=20 Marks)** | |  |  |
| **1** | Define altitude angle, zenith angle and Azimuth angle. | **CO1** | **L1** |
| **2** | Why do use pyranometer and its uses | **CO1** | **L1** |
| **3** | Explain electro magnetic energy storage method | **CO2** | **L1** |
| **4** | What is meant by solar green house? | **CO2** | **L1** |
| **5** | What the significance of strip chart and magnetic tap | **CO3** | **L1** |
| **6** | Explain what is meant by tip speed ratio | **CO3** | **L1** |
| **7** | Draw the hydrothermal convective region. | **CO4** | **L1** |
| **8** | What is meant by Bio fouling. | **CO4** | **L1** |
| **9** | What are the Limitations of Carnot cycle in DEC? | **CO5** | **L1** |
| **10** | Explain the concept of see beck effect. | **CO5** | **L1** |
|  | | | |
| **Answer All the following questions. (5X10M=50Marks)** | | **CO** | **BTL** |
| **11** | What are the reasons for variation in solar radiation reaching the earth than received at the onside of the atmosphere? | **CO1** | **L3** |
| **12** | Explain the working of Pyrheliometer with the help of neat sketch. | **CO1** | **L3** |
| **13** | Enumerate different types of concentrating collectors and also list out advantages and limitations | **CO2** | **L4** |
| **14** | Explain the principle of solar photovoltaic power generation | **CO2** | **L3** |
| **15** | Explain the advantages and limitations of wind energy conversion systems | **CO3** | **L4** |
| **16** | What is a community biogas plant? Explain the problems encountered in it | **CO3** | **L5** |
| **17** | With line diagram, explain the heat extraction from hot dry rocks. | **CO4** | **L5** |
| **18** | Draw the line diagram and explain the working of hybrid OTEC cycle | **CO4** | **L5** |
| **19** | Explain the working details of MHD accelerator. | **CO5** | **L5** |
| **20** | Draw the line diagram and explain the working of hydrogen fuel cell | **CO5** | **L5** |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **R20 Regulation Subject Code:** **C580E2**  **TKR COLLEGE OF ENGINEERING & TECHNOLOGY**  **(Autonomous, Accredited by NBA& NAAC with ‘A+’ Grade)**  **B.Tech. VIII Semester Regular Examinations, March-2024**  **Model Paper -2**  **Renewable Energy Systems**  ***CSE-DATA SCIENCE***  ***Maximum Marks: 70 Date: 20.03.2024, Duration 3 Hours*** | | | |
| **Note:** **1.This question paper contains two parts A and B.**  **2. Part A is compulsory which carries 10 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** | | **CO** | **BTL** |
| **All the following questions carry equal marks (10x2M=20 Marks)** | |  | **L1** |
| **1** | What is solar constant? | **CO1** | **L1** |
| **2** | Differentiate terrestrial and extra terrestrial solar radiation | **CO1** | **L1** |
| **3** | What are the advantages of concentrating collectors | **CO2** | **L1** |
| **4** | What do understand by photovoltaic conversion | **CO2** | **L1** |
| **5** | What is Betz limit | **CO3** | **L1** |
| **6** | List out three differences between horizontal and vertical axis wind turbine | **CO3** | **L1** |
| **7** | What is the difference between fissures and fumaroles in geothermal energy | **CO4** | **L1** |
| **8** | What is the principle of OTEC | **CO4** | **L1** |
| **9** | List out the limitations of Carnot cycle | **CO5** | **L1** |
| **10** | Write the principle of fuel cells. | **CO5** | **L1** |
| **Part-B** | | | |
| **Answer All the following questions. (5X10M=50Marks)** | | **CO** | **BTL** |
| **11** | Discuss on potential of renewable energy sources with reference to India | **CO1** | **L3** |
| **12** | Explain in brief the need for exploiting renewable energy sources. | **CO1** | **L3** |
| **13** | With a neat sketch explain working of solar water heating systems | **CO2** | **L4** |
| **14** | How are solar collectors classified? What are the important features of a solar collector | **CO2** | **L3** |
| **15** | Discuss the prospects and status of wind energy in India | **CO3** | **L4** |
| **16** | Give a brief description on types of wind turbines | **CO3** | **L5** |
| **17** | Briefly describe different analytical methods to estimate geothermal potential | **CO4** | **L5** |
| **18** | Explain the closed cycle OTEC plant and list out the major problems associated OTEC | **CO4** | **L5** |
| **19** | Explain the principle of dissociation and ionization with respect to MHD | **CO5** | **L5** |
| **20** | Explain (i) Seebeck (ii) Peltier and (iii) Joule Thomson effects | **CO5** | **L5** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **R20 Regulation Subject Code:** **C580E2**  **TKR COLLEGE OF ENGINEERING & TECHNOLOGY**  **(Autonomous, Accredited by NBA& NAAC with ‘A+’ Grade)**  **B.Tech. VIII Semester Regular Examinations, March-2024**  **Model Paper- 3**  **Renewable Energy Systems**  ***CSE-DATA SCIENCE***  ***Maximum Marks: 70 Date: 20.03.2024, Duration 3 Hours*** | | | | |
| **Note:** **1.This question paper contains two parts A and B.**  **2. Part A is compulsory which carries 10 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** | | **CO** | **BTL** | |
| **All the following questions carry equal marks (10x2M=20 Marks)** | |  |  | |
| **1** | Define altitude angle, zenith angle and Azimuth angle. | **CO1** | **L1** | |
| **2** | Why do use pyranometer and its uses | **CO1** | **L1** | |
| **3** | Explain electro magnetic energy storage method | **CO2** | **L1** | |
| **4** | What do understand by photovoltaic conversion | **CO2** | **L1** | |
| **5** | What is Betz limit | **CO3** | **L1** | |
| **6** | List out three differences between horizontal and vertical axis wind turbine | **CO3** | **L1** | |
| **7** | Comment on the origin of geothermal energy | **CO4** | **L1** | |
| **8** | Compare and contrast different types of tides | **CO4** | **L1** | |
| **9** | What are the advantages of mini/micro hydro resources | **CO5** | **L1** | |
| **10** | Explain (i) Seebeck (ii) Peltier | **CO5** | **L1** | |
| **Part-B** | | | | |  | **L1** |
| **Answer All the following questions. (5X10M=50Marks)** | | **CO** | | **BTL** |
| **11** | Explain the working of Pyrometer with the help of neat sketch | **CO1** | | **L3** |
| **12** | Explain the working of sunshine recorder with a neat sketch. | **CO1** | | **L3** |
| **13** | With the help of schematic diagram explain solar passive space cooling system. | **CO2** | | **L4** |
| **14** | Classify different solar energy storage systems and explain them in brief | **CO2** | | **L3** |
| **15** | Discuss the prospects and status of wind energy in India | **CO3** | | **L4** |
| **16** | Give a brief description on types of wind turbines | **CO3** | | **L5** |
| **17** | Discuss vapour dominated geothermal plant with a diagram | **CO4** | | **L5** |
| **18** | What is the source of tidal energy? What is the minimum tidal range required for the  working of a tidal plant? How much is the potential in tides? | **CO4** | | **L5** |
| **19** | What is the principle of MHD power generation and discuss about the main parts of an MHD generator | **CO5** | | **L5** |
| **20** | Explain the principle of operation of an alkaline fuel cell with the aid of a diagram | **CO5** | | **L5** |

|  |  |  |  |
| --- | --- | --- | --- |
| **R20 Regulation Subject Code: C580E2**  **TKR COLLEGE OF ENGINEERING & TECHNOLOGY**  **(Autonomous, Accredited by NBA& NAAC with ‘A+’ Grade)**  **B.Tech. VIII Semester Regular Examinations, March-2024**  **Model Paper -4**  **Renewable Energy Systems**  ***CSE-DATA SCIENCE***  ***Maximum Marks: 70 Date: 20.03.2024, Duration 3 Hours*** | | | |
| **Note:** **1.This question paper contains two parts A and B.**  **2. Part A is compulsory which carries 10 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** | | **CO** | **BTL** |
| **All the following questions carry equal marks (10x2M=20 Marks)** | |  |  |
| **1** | List out the applications of solar energy | **CO1** | **L1** |
| **2** | Write the principle of sunshine recorder | **CO1** | **L1** |
| **3** | Give classifications of solar collector | **CO2** | **L1** |
| **4** | What do you understand by Stratified storage | **CO2** | **L1** |
| **5** | Classify different wind turbine rotors | **CO3** | **L1** |
| **6** | Why horizontal axis wind turbines are preferred over vertical axis wind turbines | **CO3** | **L1** |
| **7** | Comment on the origin of geothermal energy | **CO4** | **L1** |
| **8** | Compare and contrast different types of tides | **CO4** | **L1** |
| **9** | What are the advantages of mini/micro hydro resources | **CO5** | **L1** |
| **10** | Differentiate Seebeck and peltier effect | **CO5** | **L1** |
| **Part-B** | | | |
| **Answer All the following questions. (5X10M=50Marks)** | | **CO** | **BTL** |
| **11** | What are the reasons for variation in solar radiation reaching the earth and that received outside the earth atmosphere | **CO1** | **L3** |
| **12** | Classify renewable energy sources? Explain in brief the need of these energy sources with special reference to India | **CO1** | **L3** |
| **13** | Differentiate between sensible and latent heat storage systems with diagrams. | **CO2** | **L4** |
| **14** | Discuss how the concentrating collectors are advantages over flat plate collectors | **CO2** | **L3** |
| **15** | Explain with the schematic diagram the working of anaerobic digestion showing input material and effluents | **CO3** | **L4** |
| **16** | Give a brief description on types of wind turbines. | **CO3** | **L5** |
| **17** | What is the current status of geothermal energy in India | **CO4** | **L5** |
| **18** | Describe the open cycle OTEC power plant and give the status of OTEC plants in India | **CO4** | **L5** |
| **19** | With the help of a diagram explain the operation of closed cycle MHD generating system | **CO5** | **L5** |
| **20** | Comment on relative performance of fuel cells | **CO5** | **L5** |
|  |  |  |  |