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| **Scheme of Valuation/Answer Key**  (Scheme of evaluation (marks in brackets) and answers of problems/key) | | | | | |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  V SEMESTER B.TECH DEGREE EXAMINATION, JULY 2019 | | | | | |
| **Course Code:EE367** | | | | | |
| |  |  |  | | --- | --- | --- | | |  |  | | --- | --- | | |  | | --- | | **Course Name: NEW AND RENEWABLE ENERGY** |   **SYSTEMS** | | | | | | | |
| Max. Marks: 100 | | |  | Duration: 3 Hours | |
| **PART A** | | | | | |
|  |  | ***Answer all questions, each carries5 marks.*** | | | Marks |
| 1 |  | What are energy resources- 1 mark  Classification – Any 4 types with brief explanation – 4 marks, one mark for each | | | (5 ) |
| 2 |  | Solar constant- 3 marks  Expression for solar constant- 2 marks | | | (5 ) |
| 3 |  | Diagram- 2 marks  Explanation of a PV based solar pumping system- 3 marks | | | (5) |
| 4 |  | Advantages- 3 marks and disadvantages – 2 marks | | | (5) |
| 5 |  | i) Cut in speed – 2 marks ii) Pitch Control- 2 marks iii) Solidity- 1 mark | | | (5) |
| 6 |  | Comparison between horizontal and vertical axis wind machines- Any 5 points – 5 marks | | | (5) |
| 7 |  | Anaerobic digestion- 5 marks | | | (5) |
| 8 |  | Fuel cells- working- Explanation- 3 marks  Any four applications of fuel cells- 2 marks. | | | (5) |
| **PART B** | | | | | |
| ***Answer any twofull questions, each carries10 marks.*** | | | | | |
| 9 | a) | Pyrheliometer- 3 marks,Pyranometer- 3 marks,Sunshine recorder- 2 marks  Explanation with Diagrams | | | (8 ) |
|  | b) | Advantages- 1 mark, disadvantages of conventional energy resources- 1 mark | | | (2 ) |
| 10 | a) | Greenhouse effect- 2 marks,Solar thermal collectors- 2 marks, Characteristic features of a collector system- 3 marks | | | ( 7) |
|  | b) | Sunset angle-80.230  Daylength-10.7 hours | | | (3) |
| 11 | a) | Energy scenario in India- 3 marks  Various non-conventional energy resources relevant to India- 2 marks | | | (5) |
|  | b) | Concentrating collectors- 1 mark,Need for orientation in concentrating collectors- 1 mark  Explanation of various types of concentrating collectors- 3 marks | | | (5) |
| **PART C** | | | | | |
| ***Answer any two full questions, each carries 10 marks.*** | | | | | |
| 12 | a) | A stand-alone PV system.-diagram- 2 marks, Explanation- 2 marks | | | (4 ) |
|  | b) | Hybrid cycle OTEC system-diagram- 3 marks, Explanation- 3 marks | | | (6) |
| 13 | a) | Major components of a tidal power plant- 6 marks | | | (6) |
|  | b) | Biofouling- 2 marks,Prevention- 2 marks | | | (4) |
| 14 | a) | Classification of TPP- 1 mark,Diagram and explanation of various types- 7 marks | | | (8) |
|  | b) | Module, array and panel- 2 marks. | | | (2) |
| **PART D** | | | | | |
| ***Answer any twofull questions, each carries 10 marks.*** | | | | | |
| 15 | a) | i) total power density in the wind stream- 613 W/m2 – 1.5 marks  ii) The maximum power density- 363 W/m2- – 1.5 marks  iii) The actual power density- 254.2 W/m2 – 1.5 marks  iv) Power output of the turbine- 19.33 kW-– 1.5 marks | | | ( 6) |
|  | b) | Emerging technologies in the field of renewable energy- 4 marks | | | (4 ) |
| 16 |  | Biomass resources- types, classification – 3 marks  Processes which are used for biomass conversion- 7 marks | | | (10) |
| 17 | a) | Fundamental mechanism- 2 marks  Advantages- 2marks  Disadvantages of a wind energy conversion system- 1 mark | | | (5) |
|  | b) | Small hydropower- 1 mark  Classification- 2 mark, Expression for the power that can be generated from a small hydro power station- 2 marks | | | (5) |
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