**TU/ CDOE**

**TEZPUR UNIVERSITY**

**SEMESTER END EXAMINATION (AUTUMN) 2020**

**DRE 105: NEW ENERGY RESOURCES**

Time:**3 Hours** Total Marks:**70**

*The figures in the right-hand margin indicate marks for the individual question.*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Fill in the blanks with appropriate answer(s). 1×5= 5

1. The apex body of UNFCCC is \_\_\_\_\_\_\_\_\_\_\_\_\_.
2. The common unit of energy density of ocean wave is \_\_\_\_\_\_\_\_.
3. A superconductor is an element or metallic alloy, which loses all electrical resistance at \_\_\_\_\_\_\_\_oC.
4. Apart from clean development mechanism (CDM), two other flexible mechanisms formulated under Kyoto protocol for promoting reduction of GHG emissions are \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_.
5. Gravimetric heating value (HHV) of methane is about \_\_\_\_\_\_\_.

2. State True or False and correct the false statement(s), if any. 2×5= 10

1. Electricity is basically a primary source of energy.
2. The earth receives the peak irradiance of about 1 W/m2  
   at the equator.
3. SOx, NOx and CO are secondary air pollutants.
4. Working temperature of very high temperature fuel cell ranges from 500 to 1000deg C.
5. The Kyoto Protocol was initially adopted in 2005 in Japan.

|  |  |
| --- | --- |
| 3. | Present a brief overview on the benefits and drawbacks of utilizing hydrogen as source of energy. Explain the methods used for efficient storage and transportation of hydrogen.  4+6= 10 |
| 4. | Discuss the principles of different types of geothermal power plants. Briefly explain the opportunities and challenges in harnessing geothermal energy for improving global energy scenario. 7+3= 10  **P.T.O.** |

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| 5. | Illustrate the distinctive features of primary and secondary batteries. Explain the necessary condition for maximum power transfer from an electrochemical battery to a load with the help of a neat diagram. Also, estimate the maximum power that can be transferred from a 12 V lead acid battery if its internal resistance is 0.02 Ω. 4+4+2=10 |

6. Explain the following, citing examples wherever necessary. 5×5= 25

1. Modern energy storage devices
2. Open cycle MHD systems
3. Objective of energy management
4. Cause of and effect of ozone layer depletion
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