**TU/ CODL**

**TEZPUR UNIVERSITY**

**SEMESTER END EXAMINATION (AUTUMN) 2019**

**DRE 105 NEW ENERGY RESOURCES**

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

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

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1. Fill in the blanks with appropriate answer(s). 1x5=5

1. Molten core of the earth is the source of \_\_\_\_\_\_\_\_\_ energy.
2. \_\_\_\_\_\_\_\_\_ is the SI unit of energy.
3. The earth receives peak solar irradiance of about \_\_\_\_\_\_\_\_ W/m2 at the equator.
4. The full form of the unit “Mtoe” is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Tidal range is the difference between \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ tide.

2. State TRUE or FALSE for the following statements and correct the

false statement(s), if any. 2×5=10

1. Magneto hydro-dynamic (MHD) power generation does not require any rotating component.
2. A 6 V lead acid battery having internal resistance of 0.05Ω can deliver maximum power of 30W.
3. Power Factor (cos ɸ) is the ratio between active power (kW) and reactive power (kVAr).
4. Gravimetric heating value of hydrogen is much lower than methane.
5. Energy density of ocean wave is directly proportional to the height of the wave.

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| 3. | Discuss various classifications of energy sources citing examples. Illustrate the role of new energy sources in addressing global environmental issues.  4+6=10 | |
|  |  | **P.T.O.** |
| .4. | What are the benefits and challenges involved in using hydrogen as a source of energy? Explain working principle of a fuel cell with the help of neat diagram. 4+6=10 | |
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| 5. | 1. Briefly explain different routes for harnessing ocean energy.   4   1. Illustrate the working principle of a super conducting magnetic energy storage system. 6 | |
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6. Explain the following, citing examples wherever necessary. 5×5=25

1. United Nations Framework Convention on Climate Change (UNFCCC)
2. Global primary energy consumption scenario
3. Cause and effect of air pollution
4. Classifications of electrochemical energy storage devices
5. Geothermal energy and its application

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