**TU/ CODL**

**TEZPUR UNIVERSITY**

**SEMESTER END EXAMINATION (AUTUMN), 2017**

**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). **1×5 = 5**

1. An average tidal range of at least \_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_ metre is necessary for harnessing tidal power.
2. The temperature at which hydrogen liquefies is \_\_\_\_\_\_ oC.
3. Super conducting magnetic energy storage (SMES) system stores energy in \_\_\_\_\_\_\_\_\_\_\_ field.
4. Apart from clean development mechanism (CDM), two other flexible mechanisms formulated under Kyoto protocol for promoting reduction of GHG emissions are \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_.
5. Electricity is basically a\_\_\_\_\_\_\_\_\_ (primary/secondary) source of energy.

2. State **true** or **false** for the following statements and correct the false statement (s). **2×5 = 10**

1. Hydrogen, when burnt in a pure oxygen environment, produces water and carbon dioxide.
2. The phosphoric acid fuel cell can also be referred as the fourth generation of fuel cells.
3. Super conducting magnetic energy storage system does not require any cooling device.
4. Only gaseous fuels can be used in fuel cells for generating electricity.
5. Direct solar radiation refers to the sunlight scattered by molecules and particles in the atmosphere yet reaching the surface of the earth.

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| 3. | Describe various classifications of energy sources citing suitable examples. Briefly explain the role of new energy resources in current energy scenario. **4+6 =10** |
| 4. | How will you classify geothermal resources? Explain briefly the operating principles of different types of geothermal power plant. **4+6 =10** |
| 5. | Present a comparative account on lithium-ion and lead acid batteries. Explain the necessary condition for transferring maximum power from an electrochemical battery to a load of *R* Ω 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 0.025 Ω.  **4+4+2=10** |
| 6. Briefly explain the following, citing examples wherever necessary. **5×5 = 25**   1. Distinctive features of MHD system 2. Estimation of power from ocean wave 3. Global warming and its implications 4. Fuel cell in automotive power plant 5. Need of modern energy storage devices   \*\*\*\*\*\* | |