Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec– 2017**

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|  |  |  |  |
| **Code :** | **17EE3013** | **Duration :** | **3hrs** |
| **Sub. Name :** | **HYDROGEN AND FUEL CELLS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Mention the need of shift reaction in hydrogen production. | CO1 | 8 |
| b. | Discuss the photo electrochemical solar cell structure and working for hydrogen production. | CO1 | 12 |
| (OR) | | | | |
| 2. | a. | Briefly write about water electrolysis. | CO1 | 10 |
| b. | Write about the woody biomass conversion of hydrogen production. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Discuss the usage and method of Hydrogen storage in the form of metallic hydrides. | CO1 | 14 |
|  | b. | Mention the limitations of liquid Hydrogen storage. | CO1 | 6 |
| (OR) | | | | |
| 4. | a. | Write about the different reactors used in the market for hydrogen production along with the fuel cell with suitable diagram. | CO2 | 12 |
|  | b. | Write about the different parameters used to evaluate the fuel cell performance. | CO2 | 8 |
|  |  |  |  |  |
| 5. | a. | Discuss the thermodynamics and kinetics of fuel cell process. | CO3 | 10 |
|  | b. | Compare the battery with fuel cell in terms of construction and performance. | CO2 | 10 |
| (OR) | | | | |
| 6. |  | Explain the different types of fuel cells along with its merits and demerits. | CO2 | 20 |
|  |  |  |  |  |
| 7. | a. | List the advantages of MCFC. | CO4 | 8 |
|  | b. | Discuss about the operation of PEMFC fuel cell. | CO5 | 12 |
| (OR) | | | | |
| 8. | a. | Analyze the economic issues related to hydrogen and fuel cell usage. | CO4 | 10 |
|  | b. | Write about the small scale power generation using the fuel cell. | CO6 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Write about the large scale fuel cell based power systems. | CO6 | 10 |
|  | b. | Discuss the applications of fuel cells in automobile and space. | CO5 | 5 |
|  | c. | Future trends in Fuel Cell. | CO6 | 5 |

ALL THE BEST