



Reg. No. :

Name :

Sixth Semester B.Tech. Degree Examination, June 2017
(2013 Scheme)
13.606.9 : NEW ENERGY SYSTEMS (MP)

Time: 3 Hours

Max. Marks : 100

PART - A

Answer **all** questions. **Each** question carries **2** marks.

1. Differentiate between thermoelectric and thermionic effects.
2. What are classifications of fuel cell ?
3. Explain the terms seeding and superconductivity.
4. What is a fission reaction ?
5. Define the terms declination angle and solar time.
6. Explain the term hybrid system.
7. What are the types of vertical axis wind turbines ?
8. Name the methods used for methanol production.
9. Explain thermo chemical process.
10. What is meant by metal hydride ?

(10×2=20 Marks)

PART - B

Answer **any one** question from **each** Module. **Each** question carries **20** marks.

Module - I

11. Describe the working of open cycle and closed cycle MHD generator. What are the merits and demerits of a MHD system ? **20**
- OR
12. a) Derive an expression for the efficiency of a thermionic generator. **10**

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- b) Using the following data calculate the efficiency of the thermionic generator and compare the same with the Carnot efficiency : **10**
- | | | |
|-----------------------------|----------|----------|
| i) Cathode work function | Φ_c | = 2.5 V |
| ii) Anode work function | Φ_a | = 2.0 V |
| iii) Temperature cathode | | = 2000 K |
| iv) Temperature surrounding | | = 1000 K |
| v) Potential drop | Φ_p | = 0.1 V |
| vi) Emissivity | | = 0.2 |

Module – II

13. a) What are the different approaches of thermo electric conversion system from solar energy ? **8**

- b) Describe the working of a central receiver solar thermal power system. **12**

OR

14. Write short notes on : **(5×4=20 Marks)**

- | | |
|----------------------|--------------------|
| i) Magnetic heating | ii) Plasma heating |
| iii) Cold fusion and | iv) Fast breeder. |

Module – III

15. Discuss with neat diagrams the different energy conversion machines used for harvesting wave energy. **20**

OR

16. a) How are wind energy conversion systems classified ? **5**

- b) Explain with a diagram the working of a horizontal axis wind energy conversion system with main components. **15**

Module – IV

17. a) Derive an expression to estimate the energy and power generated from a simple tidal power plant. **8**

- b) With a neat sketch explain the working of : **12**

- | | |
|--------------------------------------|--------------------------|
| i) Single tide cycle | ii) Single ebb cycle and |
| iii) Double cycle tidal power plant. | |

OR

18. a) Classify geothermal energy sources. **4**

- b) Explain the working of a liquid and vapour dominated geothermal power plant. **16**