

Code No: RR410206

RR

Set No. 2

IV B.Tech I Semester Examinations, November 2010
NON-CONVENTIONAL ENERGY SOURCES
Electrical And Electronics Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain spaghetti & pie diagrams briefly with the help of neat sketches.
 (b) Explain the various steps necessary to avoid low power factor. Give examples. [8+8]
2. (a) Enumerate the advantages and disadvantages of wind power.
 (b) Write short notes on potential wind power in India.
 (c) List few companies manufacturing WEC devices. [6+6+4]
3. (a) Explain the operation of a closed cycle OTEC plant with neat diagram.
 (b) Estimate the amount of electrical energy obtained from an OTEC plant working with surface water at 27°C and with a temperature difference of 15°C . Assume the density of ocean water as 1010 kg/m^3 , specific heat of water as 4200 J/kg K , turbine efficiency 0.75, generator efficiency 0.96 and diameter of tube 60 cm. The velocity of water is limited to 0.2 m/s . [8+8]
4. Write brief notes on the following:
 (a) Central receiver system
 (b) Solar farms. [8+8]
5. (a) What are the different inputs which produce Biogas? List out the factors affecting bio-digestion.
 (b) Give a neat sketch of Biogas production plant for domestic use for a family of 5-6 persons.
 (c) Explain "Energy Plantation" and state its advantages and disadvantages. [5+5+6]
6. (a) Show by sketches the method of harnessing the energy potential associated with ocean tides.
 (b) A tidal power station has 24 generators each of 10 MW operating at a maximum head of 13.5m. It generates for two 6 hour periods per day. Calculate the basin capacity in m^3 and annual energy production. Assume 93% efficiencies. [8+8]
7. Discuss the advantages and limitations of wave energy conversion. [16]
8. (a) Describe a vapour dominated or dry steam field.

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- (b) A vapour dominated system of 100MW capacity uses saturated steam with a shut off pressure of 30 bar and enters turbine at 5.0 bar and condenses at 0.15 bar. Polytropic efficiency of turbine is 80%, generator - turbine combined mechanical and electrical efficiency is 90%, water output temperature from cooling tower is 20°C and reinjection occurs prior to cooling tower.

Calculate:

- i. Steam required.
- ii. Heat rate.
- iii. Plant efficiency and
- iv. Cooling water rate.

[8+8]

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Set No. 4

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Electrical And Electronics Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Enumerate the advantages and disadvantages of wind power.
 (b) Write short notes on potential wind power in India.
 (c) List few companies manufacturing WEC devices. [6+6+4]
2. Discuss the advantages and limitations of wave energy conversion. [16]
3. (a) Explain the operation of a closed cycle OTEC plant with neat diagram.
 (b) Estimate the amount of electrical energy obtained from an OTEC plant working with surface water at 27°C and with a temperature difference of 15°C . Assume the density of ocean water as 1010 kg/m^3 , specific heat of water as 4200 J/kg K , turbine efficiency 0.75, generator efficiency 0.96 and diameter of tube 60 cm. The velocity of water is limited to 0.2 m/s . [8+8]
4. (a) Explain spaghetti & pie diagrams briefly with the help of neat sketches.
 (b) Explain the various steps necessary to avoid low power factor. Give examples. [8+8]
5. Write brief notes on the following:
 (a) Central receiver system
 (b) Solar farms. [8+8]
6. (a) What are the different inputs which produce Biogas? List out the factors affecting bio-digestion.
 (b) Give a neat sketch of Biogas production plant for domestic use for a family of 5-6 persons.
 (c) Explain "Energy Plantation" and state its advantages and disadvantages. [5+5+6]
7. (a) Show by sketches the method of harnessing the energy potential associated with ocean tides.
 (b) A tidal power station has 24 generators each of 10 MW operating at a maximum head of 13.5m. It generates for two 6 hour periods per day. Calculate the basin capacity in m^3 and annual energy production. Assume 93% efficiencies. [8+8]
8. (a) Describe a vapour dominated or dry steam field.

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- (b) A vapour dominated system of 100MW capacity uses saturated steam with a shut off pressure of 30 bar and enters turbine at 5.0 bar and condenses at 0.15 bar. Polytropic efficiency of turbine is 80%, generator - turbine combined mechanical and electrical efficiency is 90%, water output temperature from cooling tower is 20°C and reinjection occurs prior to cooling tower.

Calculate:

- i. Steam required.
- ii. Heat rate.
- iii. Plant efficiency and
- iv. Cooling water rate.

[8+8]

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Set No. 1

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Time: 3 hours

Max Marks: 80

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All Questions carry equal marks

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 (b) A vapour dominated system of 100MW capacity uses saturated steam with a shut off pressure of 30 bar and enters turbine at 5.0 bar and condenses at 0.15 bar. Polytropic efficiency of turbine is 80%, generator - turbine combined mechanical and electrical efficiency is 90%, water output temperature from cooling tower is 20°C and reinjection occurs prior to cooling tower. Calculate:
 i. Steam required.
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3. (a) Explain the operation of a closed cycle OTEC plant with neat diagram.
 (b) Estimate the amount of electrical energy obtained from an OTEC plant working with surface water at 27 °C and with a temperature difference of 15° C. Assume the density of ocean water as 1010 kg/m³, specific heat of water as 4200 J/kg K, turbine efficiency 0.75, generator efficiency 0.96 and diameter of tube 60 cm. The velocity of water is limited to 0.2 m/s. [8+8]
4. (a) Show by sketches the method of harnessing the energy potential associated with ocean tides.
 (b) A tidal power station has 24 generators each of 10 MW operating at a maximum head of 13.5m. It generates for two 6 hour periods per day. Calculate the basin capacity in m³ and annual energy production. Assume 93% efficiencies. [8+8]
5. Write brief notes on the following:
 (a) Central receiver system
 (b) Solar farms. [8+8]
6. (a) Explain spaghetti & pie diagrams briefly with the help of neat sketches.

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- (b) Explain the various steps necessary to avoid low power factor. Give examples. [8+8]
7. Discuss the advantages and limitations of wave energy conversion. [16]
8. (a) What are the different inputs which produce Biogas? List out the factors affecting bio-digestion.
- (b) Give a neat sketch of Biogas production plant for domestic use for a family of 5-6 persons.
- (c) Explain "Energy Plantation" and state its advantages and disadvantages. [5+5+6]

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Set No. 3

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Answer any FIVE Questions
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1. (a) Describe a vapour dominated or dry steam field.
(b) A vapour dominated system of 100MW capacity uses saturated steam with a shut off pressure of 30 bar and enters turbine at 5.0 bar and condenses at 0.15 bar. Polytropic efficiency of turbine is 80%, generator - turbine combined mechanical and electrical efficiency is 90%, water output temperature from cooling tower is 20°C and reinjection occurs prior to cooling tower. Calculate:
 i. Steam required.
 ii. Heat rate.
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 iv. Cooling water rate. [8+8]
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(b) Write short notes on potential wind power in India.
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(c) Explain "Energy Plantation" and state its advantages and disadvantages. [5+5+6]
6. (a) Explain the operation of a closed cycle OTEC plant with neat diagram.
(b) Estimate the amount of electrical energy obtained from an OTEC plant working with surface water at 27 °C and with a temperature difference of 15° C. Assume the density of ocean water as 1010 kg/m³, specific heat of water as 4200 J/kg K, turbine efficiency 0.75, generator efficiency 0.96 and diameter of tube 60 cm. The velocity of water is limited to 0.2 m/s. [8+8]

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7. Discuss the advantages and limitations of wave energy conversion. [16]
8. (a) Show by sketches the method of harnessing the energy potential associated with ocean tides.
- (b) A tidal power station has 24 generators each of 10 MW operating at a maximum head of 13.5m. It generates for two 6 hour periods per day. Calculate the basin capacity in m^3 and annual energy production. Assume 93% efficiencies. [8+8]

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