Code No: RR410304 **Set No. 1**

IV B.Tech I Semester Regular Examinations, November 2006
POWER PLANT ENGINEERING
(Mechanical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. What will be the future planning of power generation in India? [16]

2. (a) What are the different methods of firing coal. [6]
   (b) Make neat sketch and explain the working of
      i. Chain grate stokes.
      ii. Multi-retort stokes. [5+5]

3. (a) Mention the advantages and disadvantages of a diesel power plant over a gas turbine power plant.
   (b) Give a maintenance schedule for Diesel engine power plant. [8+8]

4. (a) What are the functions of surge tank and fore bay?
   (b) Explain the various types of dams that are used in electric power generation. [8+8]

5. (a) Explain the working of a thermoelectric engine with suitable sketches.
   (b) What is the figure of merit of thermoelectric generator? How can it be assessed? [8+8]

6. (a) With a neat block diagram explain the governing system of a open cycle gas turbine power plant.
   (b) Discuss the advantages of gas turbine power plant over diesel power plant. [8+8]

7. (a) How nuclear reactors are are classified? [5]
   (b) Discuss the advantages and disadvantages of Pressurized Water Reactor. [6]
   (c) Give a brief account of nuclear waste disposal. [5]

8. (a) What are the basic elements exhausted with the flue gases . Which are hazardous to human health. [8]
   (b) Discuss the various methods of reducing sulphur dioxides in emissions. [8]

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Code No: RR410304 **Set No. 2**

IV B.Tech I Semester Regular Examinations, November 2006
POWER PLANT ENGINEERING
(Mechanical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Discuss the relative merits of different out plant coal handling.
   (b) Describe the hydraulic ash handling system. With the help of sketch. [8+8]
2. (a) Explain sodium carbonate feed water treatment.
   (b) Explain electro - chemical theory of Corrosion. [8+8]
3. (a) List the advantages of super charging of diesel engines. [4]
   (b) Write short notes on the following:
      i. Fuel injection system [4]
      ii. Air supply system [4]
      iii. Exhaust system [4]
4. What are the various factors to be considered in selecting the site for a hydro electric power plant and sicuss about primary and secondary investigations. [16]
5. (a) What is the importance of the parameter gas conductivity in MHD Generation?
   (b) With neat sketch explain the MHD cycle combined with thermal power cycle. [8+8]
6. With a neat sketch explain the working of a simple constant pressure gas turbine. Mention its advantages and disadvantages. [16]
7. (a) On what factor does the nuclear reaction rate depend? [6]
   (b) Explain the term Breeding. [5]
   (c) How nuclear wastes are disposed and explain the main difficulties in handling radioactive wastes? [5]
8. (a) Explain
      i. Load factor
      ii. Demand factor [6]
   (b) A power station has to supply load as follows :

Time (Hr)	0-6	6-12	12-14	14-18	18-24
Load (MW)	30	90	60	100	50

      i. Draw the load curve

ii. Draw load duration curve.
iii. Calculate load factor
iv. Calculate plant capacity [10]

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Code No: RR410304 **Set No. 3**

IV B.Tech I Semester Regular Examinations, November 2006
POWER PLANT ENGINEERING
(Mechanical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Draw a general layout of a thermal power plant and explain the working of different circuits. [16]

2. (a) What are the different methods of firing coal. [6]
   (b) Make neat sketch and explain the working of
      i. Chain grate stokes.
      ii. Multi-retort stokes. [5+5]

3. (a) Explain with sketches any two types of super charging methods of diesel engines.
   (b) List the disadvantages of diesel power plants. [8+8]

4. What are the various factors to be considered in selecting the site for a hydro electric power plant and sicuss about primary and secondary investigations. [16]

5. (a) What are the advantages of a fuel cell?
   (b) Discuss the problems associated with the operation of a fuel cell. [8+8]

6. (a) Give the advantages and disadvantages of open cycle gas turbine power plant.
   (b) A simple open cycle gas turbine plant works between the pressures of 1 bar and 6 bar and temperatures of 300 K and 1023 K. The calorific value of the fuel used is 42 MJ/kg.
   Find :
      i. air-fuel ratio,
      ii. Thermal efficiency of the plant if the mechanical and generating efficiencies are 95% and 97% respectively. Assume air flow = 20 kg/s and compression and expansion are isentropic. [8+8]

7. (a) What do you understand by thermal shielding? [4]
   (b) What are the functions of a reflector? [4]
   (c) Explain the working and characteristic features of a homogeneous reactor. [8]

8. (a) Explain
      i. Plant capacity factor [2]
      ii. Plant use factor [2]
      iii. Load factor [2]

(b) A central power station has annual factors as follows :
Load factor = 60%
Capacity factor = 40%
Use factor = 50%
Power station has a maximum demand of 15000 kw .
Determine

i. Annual energy production.
ii. Reserve capacity over and above peak load
iii. Hours per year not in service. [10]

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Code No: RR410304 **Set No. 4**

IV B.Tech I Semester Regular Examinations, November 2006
POWER PLANT ENGINEERING
(Mechanical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Draw a chart showing operations and devices used in coal handling plant.
   (b) Describe different types of coal conveyors. [8+8]
2. (a) Explain sodium carbonate feed water treatment.
   (b) Explain electro - chemical theory of Corrosion. [8+8]
3. (a) Explain with sketches any two types of super charging methods of diesel engines.
   (b) List the disadvantages of diesel power plants. [8+8]
4. (a) Explain in detail the spillways, baffle piers and drainage gallery.
   (b) Explain the various factors to be considerd in the selection of a hydraulic turbine. [8+8]
5. Explain with a neat sketch the principle of working of an MHD generator. What are the problems encountered in design? [16]
6. With a neat sketch explain the working of a simple constant pressure gas turbine. Mention its advantages and disadvantages. [16]
7. (a) How nuclear reactors are are classified? [5]
   (b) Discuss the advantages and disadvantages of Pressurized Water Reactor. [6]
   (c) Give a brief account of nuclear waste disposal. [5]
8. (a) Explain load curve and load duration curve. [6]
   (b) A power plant has the following annual factors Load factor = 70 % , Capacity factor =50 % , Use factor = 60 % Maximum demand is 20 MW. Find
      i. Annual energy production.
      ii. Reserve capacity over and above peak load.
      iii. Hours during which the plant is not in service per year. [10]

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