



# KINGS

COLLEGE OF ENGINEERING



## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### **QUESTION BANK**

**NAME OF THE SUBJECT: EE 2252 POWER PLANT ENGINEERING**

**YEAR / SEM: II / IV**

### **UNIT I**

#### **THERMAL POWER PLANTS** **PART A (2 marks)**

1. What is a thermodynamic cycle?
2. What are the assumptions made for air standard cycle analysis?
3. Define air standard cycle efficiency.
4. List out the major advantages of high pressure boilers in modern thermal power plants.
5. What is the function of economizer?
6. What are the modern trends in generating steam of high pressure boiler?
7. What are types of fluidized bed boilers?
8. What are all the features of the high-pressure boilers?
9. What is cooling tower approach?
10. What are the advantages of burning coal in pulverized form?

#### **PART B (16 marks)**

1. Explain the construction and working of Steam power plant with a layout. (16)
2. (a) Why are feed water heaters used? (8)  
(b) Explain with a sketch the working of a Barometric condenser? (8)
3. (a) Discuss the relative merits of different out plant coal handling. (8)  
(b) Describe the hydraulic ash handling system. (8)
4. (a) Draw a chart showing operations and devices used in coal handling plant. (8)  
(b) Describe different types of coal conveyors. (8)
5. What is the importance of thermal power development in the country? Describe its development in the last 10 years. (16)
6. Explain the construction and working of any one High pressure boiler with a layout. (16)

7. Explain the construction and working of any one Fluidised bed boiler with a layout. (16)

## **UNIT II**

### **HYDRO ELECTRIC POWER PLANTS**

#### **PART A (2 marks)**

1. What is the purpose of surge tank in a hydroelectric power plant?
2. What are the three main factors for power output of hydroelectric plant?
3. Give an example for a low head turbine, a medium head turbine and a high head turbine.
4. What are reaction turbines? Give example.
5. Differentiate the impulse and reaction turbine.
6. Define unit speed of turbine.
7. What is the significance of specific speed of hydraulic turbines?
8. What is the function of surge tank in a hydro electric power plant?
9. What is a draft tube? In which type turbine it is mostly used?
10. Write the function of draft tube in turbine outlet?

#### **PART B (16 marks)**

1. Explain the construction and working of Hydel power plant with a layout. (16)
2. What are the various factors to be considered in selecting the site for a hydro electric power plant and discuss about primary and secondary investigations. (16)
3. Explain the design aspects of a pelton wheel. (16)
4. Describe the classification of turbines. (16)
5. What are the components of the Francis turbine and describe briefly. (16)
6. (a) Explain in detail the spillways, baffle piers and drainage gallery. (8)  
(b) Explain the various factors to be considered in the selection of a hydraulic turbine. (8)
7. (a) What are surge tanks and state its purpose. (8)  
(b) Differentiate Francis turbine between Kaplan turbines. (8)
8. (a) Explain the terms catchment area, rain fall and run off. (8)  
(b) Explain the arrangement of the components of a hydro electric power plant with a neat sketch. (8)

## **UNIT III**

### **NUCLEAR POWER PLANTS**

#### **PART A (2 marks)**

1. How the nuclear reactors are classified?
2. Give the requirements of chain reaction.
3. What is "half life" of nuclear fuels?
4. What do you understand by moderation?

5. Explain the function of the moderator.
6. Define the term "Breeding".
7. What factors control the selection of a particular type of a reactor?
8. What are the components pressurized water reactor nuclear power plant?
9. What are the components of supercritical water reactor nuclear power plant?
10. List down the nuclear waste disposal methods.

### **PART B (16 marks)**

1. Explain the construction and working of Nuclear power plant with a layout. (16)
2. (a) What is a chain reaction? How it is controlled. (5)  
(b) Describe the fast breeder reactor. (6)  
(c) What is function of shield? What are the different types of shields? (5)
3. (a) With neat sketch explain the boiling water reactor power plant. (8)  
(b) What are the advantages and disadvantages of nuclear power plant? (8)
4. (a) What are the advantages and disadvantages of breeder reactor? (5)  
(b) What do you mean by fission of nuclear fuel? (5)  
(c) Explain briefly about radiation hazards and shielding? (6)
5. (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)

## **UNIT IV**

### **GAS AND DIESEL POWER PLANTS**

#### **PART A (2 marks)**

1. What are the main units in a gas turbine power plant?
2. How the gas turbine blades are cooled?
3. Mention the various processes of the brayton cycle.
4. Define mean effective pressure as applied to gas power cycles.
5. How it is related to indicated power of an I.C. engine?
6. Draw the p-V and T-s diagram of Brayton cycle.
7. Sketch the schematic arrangement of open cycle gas turbine plant and name the components.
8. Discuss the effect of inter cooling in a gas turbine plant.
9. What is the principle of operation of simple jet propulsion system?
10. Why is the maximum cycle temperature of gas turbine plant much lower than that of diesel power plant?
11. List out the inherent advantages of the combined power cycle.

#### **PART B (16 marks)**

1. Explain the construction and working of Gas turbine power plant with a layout. (16)

2. (a) Explain with the help of a block diagram the fuel storage and supply system of diesel power plant. (8)
  - (b) Explain with the help of a block diagram the water cooling system of diesel power plant. (8)
  3. (a) Mention the advantages and disadvantages of a diesel power plant over a gas turbine power plant. (8)
  - (b) Give a maintenance schedule for Diesel engine power plant. (8)
  4. Describe the following systems in brief with respect Diesel Power Plant.
    - (a) Fuel storage and supply system (5)
    - (b) Exhaust system (5)
    - (c) Lubrication system (6)
  5. (a) Draw a neat layout of a diesel power plant and label all the components. (10)
  - (b) List the advantages of diesel power plant s over other thermal power plants. (6)
  6. (a) Explain the cooling system of a Diesel power plant. (8)
  - (b) What are the different types of engines used in Diesel power plants. (8)
  7. With a neat sketch explain the working of a simple constant pressure gas turbine. Mention its advantages and disadvantages. (16)
  8. (a) With help of a block diagram explain the main components of a open cycle gas turbine power plant. (8)
  - (b) Give the classification of gas turbine power plants. (8)
  9. (a) Give the advantages and disadvantages of open cycle gas turbine power plant. (8)
  - (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. airfuel 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)

## **UNIT V**

### **NON – CONVENTIONAL POWER GENERATION**

#### **PART A (2 marks)**

1. What is geothermal energy?
2. What are the application of geothermal energy?
3. What are the different geothermal fluids?
4. What are the forms of geothermal energy stored deeply inside the earth?
5. What are the important criteria while selecting the geothermal energy?
6. What are the different types of geothermal energy deposits?
7. What are the different working fluids in binary cycle geothermal power plants?
8. What are the different types of OTEC?
9. What are the working fluids in closed cycle OTEC?

10. What are the components of Tidal power plants?

**PART B (16 marks)**

1. Explain the construction and working of Geo thermal power plant. (16)
2. What are the different types of geothermal energy system? (16)
3. Explain the working principle of OTEC. (16)
4. What are the different types of Tidal power plants? (16)
5. Explain the Solar thermal central receiver system. (16)
6. What are the different types of ocean thermal energy conversion system? (16)
7. Explain the analysis of a central receiver system. (16)