POWER PLANT ENGINEERING

UNIT – 1: THERMAL POWER PLANTS

1. Draw a general lay out of a thermal power plant and explain the working of different circuits.
2. What factors are considered for selecting a site for a big thermal power plant?
3. How much coal, cooling water and combustion air are required for a thermal power station of 500 MW capacity per hour.
4. How much ash and SO2 are produced per day from a plant of Koradi size if Indian low grade coal is used.
5. What is the importance of thermal power plant in the national power grid?
6. What is meant by overfeed and underfeed principles of coal firing? Which is preferred for high volatile coal and why.
7. What are the advantages of burning the fuels in pulverized form?
8. Why ash and dust handling problem is more difficult than coal handling problems.
9. What are different ash handling systems? Discuss the relative merits and demerits.
10. Draw a general lay out of a thermal power plant and explain the working of different circuits.
11. What factors are considered for selecting a site for a big thermal power plant?
12. How much coal, cooling water and combustion air are required for a thermal power station of 500 MW capacity per hour.
13. How much ash and SO2 are produced per day from a plant of Koradi size if Indian low grade coal is used.
14. What is the importance of thermal power plant in the national power grid?
15. What is meant by overfeed and underfeed principles of coal firing? Which is preferred for high volatile coal and why.
16. What are the advantages of burning the fuels in pulverized form?
17. Why ash and dust handling problem is more difficult than coal handling problems.
18. What are different ash handling systems? Discuss the relative merits and demerits.
19. How the ash produced carries the importance in the selection of thermal power plant site.

UNIT – 2: HYDROELECTRIC POWER PLANTS
1. What are the different factors to be considered while selecting the site for hydroelectric power plant?
2. How the hydroelectric power plants are classified.
3. How the most economical capacity of hydroelectric power plant is decided.
4. What do you understand by run-off river power plant and how its performance is increased by introducing a pondage in the plant?
5. Explain in detail about pump storage plant.
6. Draw a neat diagram of storage type hydroelectric power plant and describe the function of each component used in the plant.
7. Mention the advantages and disadvantages of hydroelectric power plants compared with thermal power plants.
8. Why the combined operation of hydro and thermal plants is more economical than individual operation of the plant.
9. What do you understand by pump storage plant and what are the advantages and limitations of this plant.
10. What are the specific advantages of storage reservoir type power plant? How they differ from other types of hydro power plant?

UNIT – 3: NUCLEAR POWER PLANTS

1. Why uranium oxide is preferred over uranium as fuel.
2. Why cladding is necessary. What are the requirements of a good cladding material?
3. What properties are required for a good coolant? Which gases are used as coolant?
4. What are the desirable properties of a good moderator? Compare H2O, D2O and C as moderators.
5. What are the desirable properties of control rod materials? Compare the merits and demerits of different control rod materials.
6. Why shielding of a reactor is necessary. What do you understand by thermal shielding?
7. Compare the properties of stainless steel and zirconium for use as reactor fuel element cladding.
8. How induced radioactivity affects the cost of shielding.
9. Considering the problem of induced radioactivity which coolant among water and sodium is more desirable and why.
10. Discuss the advantages and disadvantages of Lithium, Bismuth and sodium as coolants for nuclear reactors.

UNIT – 4: GAS AND DIESEL POWER PLANTS
1. What are the main advantages of a combined cycle system in the present power picture of the world?
2. Draw the line diagrams of repowering system using steam turbine only and boiler only. Discuss the merits and demerits also.
3. What is the gasification of coal and explain in detail.
4. What are the merits and demerits of using air or O2 in a gasification plant when the gasification plant is integrated with closed cycle?
5. What do you understand by PFBC, Explain in detail?
6. Draw the line diagrams of two different PFBC systems which are commonly used and discuss their merits and demerits.
7. What are the main difficulties faced in developing the combined cycles with PFBC.
8. Why and when organic fluid is preferred over water in the bottoming cycle. What are its advantages?
9. Discuss the part behavior of combined cycle plant and compare with conventional gas turbine plant of the same capacity.
10. What future developments are expected in combined cycle plants?

UNIT – 5: NON-CONVENTIONAL POWER GENERATION

1. What are the non-conventional sources of energy and why are they seriously thought throughout the world.
2. What are the different sources of geothermal energy?
3. Discuss the different systems used for generating the power using geo-thermal energy.
4. What are the specific environmental effects if the geothermal source of energy is used for power generation?
5. What factors are considered for selecting a suitable site for tidal power plants?
6. Differentiate with neat sketches the difference between single basin and double basin systems.
7. List out the advantages of tidal power plants over the conventional hydel power plants.
8. What are the basic requirements for locating a wind power plant? What factors affect them?
9. What methods are used to overcome the fluctuating power generation of a wind mill?
10. Explain the working of a fuel cell and list out its advantages over other non-conventional systems of power generation.