

18565

(3 Hours)

[Total Marks: 80]

- NB:** (1) Question No. 1 is compulsory.  
 (2) Attempt any **Three** questions from remaining.  
 (3) Figures to the right indicate full marks.

1. Answer the following:- [20]  
 (a) Explain renewable and non-renewable energy resources with suitable examples.  
 (b) Explain Boiler safety interlocks.  
 (c) Why is regenerator used in a gas turbine power plant?  
 (d) What is the role of control and instrumentation in power plants?

2. (a) A Power generating station has a maximum demand of 10,000KW [05]  
 and the daily load on the station is as follows:

Time	6am to 8am	8am to 12noon	12noon to 1pm	1pm to 5pm	5pm to 7pm	7pm to 9pm	9pm to 11pm	11pm to 6am
KW	3,500	8,000	3,000	7,500	8,500	10,000	4,500	2,000

Draw the Load Curve and the Load Duration Curve.

- (b) Explain Shrinking and Swelling effects in boiler. [05]  
 (c) Explain the following different loops/circuits involved in thermal power plant,  
 i) Feed Water and Steam Flow    ii) Fuel Circuit.  
 iii) Air and Gas Circuit            iv) Cooling water circuit. [10]
3. (a) Explain wind turbine aerodynamics using Betz model.  
 Find maximum power extracted. [10]  
 (b) Describe the principle of solar photovoltaic energy conversion system with neat sketch. What are the major advantages and disadvantages of solar PV system? [10]
4. (a) Sketch a neat labeled diagram of Pressurized Water Reactor (PWR) and explain its operation with advantages and limitations. [10]  
 (b) What is the function of following essential elements of hydroelectric power plant:  
 i) Headrace ii) Tailrace iii) Surge Tank iv) Spillways v) Draft Tubes. [10]
5. (a) Explain the energy extraction process from Biomass and Geothermal energy. [10]  
 (b) Give the detailed classification of Solar Collector and explain flat plate collector with neat sketch. [10]
6. Write Short note on:- (Any Two) [20]  
 (a) Compare Thermal, Nuclear and Hydroelectric power plant.  
 (b) Horizontal Axis Wind Turbine.  
 (c) Diesel Power Plant.

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