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**Question Paper Code: 45705**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Fifth Semester

Mechanical Engineering

14UME505 - POWER PLANT TECHNOLOGY

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Identify the non-renewable energy resource from the following
  - Coal
  - Fuel cells
  - Wind power
  - Wave power
- In a thermal power plant, cooling towers are used to
  - Condense low pressure steam
  - Convert water to ice
  - Cool water used in condenser for condensing steam
  - Cool feed water of boiler
- Pulverized coal is a
  - Coal free from ash
  - Non-smoking coal
  - Coal which burns for long time
  - Coal broken into uniform particles
- In a steam turbine cycle, the lowest pressure occurs in
  - Turbine inlet
  - Boiler
  - Condenser
  - Super heater
- Which of the following material can be used as a moderator?
  - Graphite
  - Heavy water
  - Beryllium
  - none of these

6. In a hydro-electric plant a conduct system for taking water from the intake works to the turbine is known as  
 (a) Dam                      (b) Reservoir                      (c) Penstock                      (d) Surge tank
7. The air standard cycle of a gas turbine plant is  
 (a) Dual cycle                      (b) Brayton cycle  
 (c) Rankine cycle                      (d) Carnot cycle
8. Gas turbine is widely used in  
 (a) Pumping stations                      (b) Aircraft  
 (c) Locomotives                      (d) Automobiles
9. Efficiency of the solar panel decreases with  
 (a) Decrease in temperature                      (b) Increase in temperature  
 (c) Decreases with pressure                      (d) None of these
10. In pumped storage, the  
 (a) Power is produced by means of pumps  
 (b) Water is stored by pumping  
 (c) Water is re circulated through turbine  
 (d) Downstream water is pumped up-stream during off load periods

PART - B (5 x 2 = 10 Marks)

11. Define load curve.
12. List any four high pressure boilers.
13. Indicate the purpose of control rod in a nuclear power plant.
14. Enumerate the functions of intercooler in gas turbine power plant.
15. Signify the factors to be considered in site selection for geothermal energy.

PART - C (5 x 16 = 80 Marks)

16. (a) With neat diagram explain the working of gas turbine-steam turbine combined cycle plant and mention its advantages. (16)

Or

- (b) Explain the working principle of Fluidized Bed Boiler with a neat sketch. (16)

17. (a) Elaborate the following (i) Chain grate stoker (ii) Spreader stoker. (iii) Multi retort stoker and (iv) under grate stoker. (16)

Or

- (b) List the different types of coal-pulverizing mills. Enumerate its significance. Describe ball mill with a sketch. (16)

18. (a) Illustrate with a sketch the working of a nuclear power plant and explain the various components in detail. (16)

Or

- (b) (i) Explain the operation of an electronic precipitator with a neat sketch. (8)  
(ii) Explain the Evaporative Condenser with a neat diagram. (8)

19. (a) How do you select engine for a diesel power plant ? Draw a diesel power plant and explain its major components. (16)

Or

- (b) Explain the constructional details and operation of a gas turbine power plant. List the advantages and limitations of open and closed cycle gas turbine power plant. (16)

20. (a) Describe the working principle of closed cycle or Anderson OTEC power plant with a schematic diagram. (16)

Or

- (b) Enumerate the construction of a solar central receiver system. Explain the function and its types. (16)

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