PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2018-19 Examination

Semester: 4   Date: 03/05/2019
Subject Code: 03106253   Time: 02:00pm to 04:30pm
Subject Name: Power Plant Engineering   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions (All are compulsory) (Each of one mark)   **(15)**

1. In steam power plant the exhausted steam from steam turbine is condensed by means of _____.

2. Rise in sea level is one of the effects of _____.

3. In hydro-electric power plant, the head available to impulse turbine for its proper working should be _____.

4. Graphite works as a _____ in nuclear reactor.

5. Wind turbine blades have _____ type cross section to extract energy from wind.

6. Photovoltaic method uses _____ for direct conversion of solar energy into electrical energy.

7. In thermo-electric conversion system _____ energy of sun is used to generate electricity.

8. A single 'hydrox' fuel cell can produce an emf of _____volts at 1 atm and 25°C.

9. The assembly of apparatus used to change some characteristic of electric supply is called _____.

10. The rate at which electrical energy is supplied to a consumer is known as _____.

11. _____ can be considered as greenhouse gas.
    (a) Carbon dioxide   (c) Chloro-Fluoro carbons
    (b) Nitrous Oxide Methane   (d) All of above.

12. The overall efficiency of steam power station is about _____%
    (a) 29   (c) 10
    (b) 50   (d) 70

13. _____ can be used to measure solar radiation.
    (a) Pyrheliometer   (c) Solar Cell
    (b) Battery   (d) Blocking diode

14. The conversion efficiency of an MHD system can be around _____%.
    (a) 50%   (c) 60%
    (b) 55%   (d) 65%

15. The value of Load factor is always _____.
    (a) less than 1   (c) equal to 1
    (b) greater than 1   (d) equal to 0.

Q.2 Answer the following questions. (Attempt any three)   **(15)**

A) Explain the working of Thermal power station with neat schematic diagram.
B) Draw the schematic diagram of gas turbine power plant and explain its working.
C) Explain molten carbonate fuel cell with necessary diagram and reactions.

D) A 100MW power station delivers 100MW for 2 hours, 50MW for 6 hours and is shut down for the rest of each day. It is also shut down for maintenance for 45 days each year. Calculate its annual load factor.

Q.3 A) i) Write a note on nuclear reactor. **04**

    ii) Distinguish between indoor and outdoor substation. **03**

   B) Derive the equation of maximum power developed from the HAWT. **08**

<div align="center">**OR**</div>

   B) Describe with neat sketch the working of Wind Energy Conversion System (WECS) with its main components. **08**

Q.4 A) Explain basic PV cell system for power generation and explain each block. **07**

<div align="center">**OR**</div>

   A) List out different applications of Solar Energy and explain Solar Distillation with diagram. **07**

   B) i) State the function of following hydraulic structures in hydroelectric power plant :-
    (a) Surge Tank (b) Penstock (c) Dam (d) Spillways **04**

    ii) Explain the working principle of MHD power generation with diagram. **04**