

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



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VI SEMESTER B.TECH (MECHANICAL ENGINEERING) END SEMESTER EXAMINATIONS, MAY 2016

SUBJECT: POWER PLANT ENGINEERING [MME 342]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ANY FIVE FULL the questions.
- ✤ Missing data may be suitable assumed.
- **1A.** Define the following:
 - (a) Plant capacity factor
 - (b) Diversity factor
- 1B. Explain various factors taken into consideration while selecting a site for a power plant.
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- **1C.** The maximum demand of a power station is 96000 kw and the daily load curve is described as follows:

Time (hrs.)	0-6	6-8	8-12	12-14	14-18	18-22	22-24
Load (MW)	48	60	72	60	84	96	48

(a) Draw the load curve

- (b) Determine the load factor of power station
- (c) What is the load factor of standby equipment rated at 30 MW that takes up all load in excess of 72 MW? Also calculate its use factor. 06
- **2A.** Sketch and explain the working of a pumped storage plant.
- **2B.** List out the functions of a surge tank in a hydel power plant.
- **2C.** The yield of water in mm³ from a catchment area during each successive **05** month is given in the table below:

1.4	2.1	2.8	8.4	11.9	11.9
7.7	2.8	2.52	2.24	1.96	1.68

Draw the mass curve and determine the minimum capacity of a reservoir required to allow the above volume of water to be drawn off at a uniform rate assuming that there is no loss of water over the spillway.

3A.	With a neat sketch explain the principle of overfeed stoker.	03
3B.	Sketch and explain the principle of working of Benson boiler.	03
3C.	Calculate the mass of flue gases flowing through the chimney when the draught produced is equal to 1.9cm of water. Temperature of flue gases is 290°C and ambient temperature is 20°C. The flue gases formed per kg of fuel burnt are 23kg. Neglect the losses and take the diameter of the chimney as 1.8m.	04
4A.	Sketch and explain the working of common rail injection system used to inject fuel in diesel plants.	03
4B.	Define 'Draught'. List out any two advantages and limitations of chimney draught.	03
4C.	Sketch and Compare the working of open and closed cycle gas turbine plant.	04
5A.	Explain briefly the following: (a) pondage (b) Catchment area	04
5B.	List out any three merits and demerits of Hydel plants over Thermal power plants.	03
5C.	With the help of a neat labelled diagram explain the working of a Vertical Lift gate employed in hydro-electric power plants.	03
6A.	Sketch and explain the working of a Pressurized Water Reactor.	04
6B.	Sketch and explain in detail the main parts of a nuclear reactor.	04
6C.	List out any two advantages and disadvantages of Fast Breeder Reactor.	02