Registration No :

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B.Tech.
FEEE6401

8th Semester Regular / Back Examination 2017-18
POWER STATION ENGINEERING AND ECONOMY
BRANCH : EEE, ELECTRICAL
Time : 3 Hours
Max Marks : 70
Q.CODE : C528
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Q1 **Answer the following questions :** **(2 x 10)**
   a) What is the importance of maximum demand and plant capacity factor?
   b) What are the two basic functions of a dam?
   c) Write any two disadvantages of Boiling Water Reactor over Pressurized Water Reactor?
   d) What are the two desirable properties of moderator?
   e) Classify nuclear reactor on the basis of fuel moderator assembly.
   f) What is a mass curve? What does the slope of the curve at a point indicate?
   g) A flow of 75 m^3/s under a head of 110 m is available at a site for a hydro power station. If the efficiency of the turbine is 88%, determine the magnitude of the hydro power developed.
   h) Mention any four factors that affect run-off.
   i) What is the importance of super heater in a thermal power plant? What are the two types of super heater?
   j) What is the importance of air preheater in a thermal power plant?

Q2 **a)** The peak load on a power plant is 60MW. The loads having maximum demands of 30MW, 20 MW, 10 MW and 14 MW are connected to the power plant. The capacity of the power plant is 80MW and the annual load factor is 0.5. Estimate (i) the average load on the power plant (ii) energy supplied per year (iii) demand factor (iv) diversity factor (v) maximum demand. **(5)**
   b) A generating station has the following daily load cycle : **(5)**

Time (hrs)	0-6	6-10	10-12	12-16	16-20	20-24
Load (MW)	40	50	60	50	70	40

   Draw the load curve and find (i) maximum demand (ii) units generated per day (iii) average load and (iv) load factor.

Q3 **a)** Explain the working of Boiling Water Reactor with the help of a neat diagram. **(5)**
   b) Give two examples of (i) nuclear fuel (ii) moderator (iii) coolant (iv) Control rods (v) Biological and Thermal shield in a nuclear power plant. **(5)**

Q4 **a)** What are the factors to be considered while selecting site for a hydroelectric power plant? **(5)**

b) The mean monthly discharge of a particular site is as follows : **(5)**

Month	Discharge (m^3/s)	Month	Discharge (m^3/s)
January	100	July	1000
February	225	August	1200
March	300	September	900
April	600	October	600
May	750	November	400
June	800	December	200

    (i) Draw the hydrograph and also find the mean flow.
    (ii) Draw the flow duration curve.

Q5 **a)** Define water hammer. How the effect of water hammer can be reduced in a hydro power plant? **(5)**

    b) Explain the constructional details and working principle of Pelton turbine with the help of a neat diagram. **(5)**

Q6 **a)** Draw a neat layout of a thermal power plant. Also explain the air and gas circuit of a thermal power plant. **(5)**

    b) Briefly explain the construction and working principle of electrostatic precipitator with the help of a neat diagram. **(5)**

Q7 **Differentiate between :** **(10)**
    (a) Fire Tube Boiler and Water Tube Boiler
    (b) Francis turbine and Kaplan turbine
    (c) Jet Condenser and Water Condenser
    (d) Impulse Turbine and Reaction Turbine
    (e) Nuclear Fission and Nuclear Fusion

Q8 **Write short answer on any TWO :** **(5 x 2)**
    a) Economiser in Thermal Power Plant
    b) Breeder Reactor
    c) Hydrology and Hydrologic cycle
    d) Surge tanks and conduits