GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

SM19002071

Registration No: | | | | | | | | | | |

Total Number of Pages : 1 **M.TECH**

M.TECH 2ND SEMESTER (AR 17) SUPPLEMENTARY EXAMINATIONS, APRIL/MAY 2019

POWER PLANT AND PRACTICE

Branch: TE, Subject Code:MTEPE2053

Time: 3 Hours **Max Marks : 70**

PART-A **(10 X 2=20 MARKS)**

1. Answer the following questions.

a) What do you understand by drought? Classify it.
b) What is the effect of regeneration and reheating in gas turbine power plants?
c) Explain the effects of variable loads on power plant?
d) Define vacuum efficiency applied to a condenser.
e) What are the two different methods used to control NO_x and SO_x in flue gases?
f) Define Load factor and Capacity factor.
g) List out the major advantages of the combined power cycles.
h) Which reactor has been selected under India's nuclear power programme and why?
i) What is the purpose of governing in steam turbine?
j) What do you mean by environmental audits?

PART-B **(5 X 10=50 MARKS)**

Answer any five questions from the following.

2 a) Explain the operation of an elastic precipitator with neat sketch. [5]
b) Draw a neat diagram of cyclone burner and describe its working? [5]

3 a) What are the different methods of governing the steam turbine? Explain one of the methods with diagram? [5]
b) Water at 30^OC flows into a cooling tower at a rate of 1.15kg per kg air. Air enters the tower at the dbt of 20^OC and a relative humidity of 60% and leaves it at a dry blub temperature of 28^OC and 90% relative humidity. Makeup water is supplied at 20^OC. Determine (a) the temperature of water leaving the tower, (b) the fraction of water evaporated and (c) the approach and the range of the cooling tower. [5]

4 a) Explain with diagram the working of PWR and BWR. [8]
b) Explain the advantages and disadvantages of PWR and BWR. [2]

5 a) Write down the chemical methods to reduce emission. [5]
b) Which undesirable emissions generated from combustion causes air pollution and write down the physics behind them. [5]

6 a)A reactor is fuelled with 100 tonnes of natural uranium (atomic mass 238.05) in which the average thermal neutron (2200 m/sec) flux is 1013 neutrons/cm2s, the 2200 m/sec cross section of U-235(atomic mass 235.04) are; σ_f = 579 barns , σ_f = 101 barns, the energy release per fission is 200MeV and 0.715% of natural uranium is U-235. Calculate (a) the rating of the reactor in MW/tone, (b) the rate of consumption of U-235 per day. [8]
b) What do you mean by activity and half-life? [2]

7 a) A forced draught fan supplies air at 10m/sec against a draught of 20 mm of water across the fuel bed. Estimate the power required to run the fan if 2500 kg/h of coal is consumed and 16 kg of air is supplied per kg of coal burned. The temperature of the flue gases and ambient air may be taken as 600 K and 300 K respectively. If the forced draught fan is replaced by an induced draught fan, what will be the power required to drive the fan? [8]
b) What is the difference between FD and ID fans? [2]

8 Write short notes on :
a) Thermo electric power generation [5]
b) PFBC [5]

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