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

Total Number of Pages: 01

M .TECH
HTPE106

First Semester Examination – 2013
THERMAL AND NUCLEAR POWER PLANTS

Time: 3 Hours

Max Marks: 70

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2 x 10)

a) What is "half life" of nuclear fuels?
b) List down the nuclear waste disposal method.
c) Define the term "Breeding"
d) What are the advantages of reheat cycle over simple ranking cycle?
e) Define super critical boilers. Give examples.
f) What are the methods used in ash handling system?
g) What are the fission fragments and fission products.
h) What is nuclear stability? Why are elements of higher mass number not stable?
i) What is a curie? What is a roentgen?
j) What are the advantages of regenerating cycle over simple ranking cycle?

Q2 a) What are recuperative air preheater? Why are baffles provided? Why is the overall heat transfer coefficient in APH low? (5)

b) Explain different types of super heaters and super heater control mechanisms used in steam generator. (5)

Q3 a) Explain different types of furnaces and its applications. (5)

b) Explain the functions of economizer in boiler and how boiler maintenance is conducted. (5)

Q4 a) Calculate the height of chimney required to produce a draught of equivalent to 20 mm of water if the flue gas temperature is 260°C and ambient temperature is 27°C and the stoichiometric requirement is 18 kg per kg of fuel. Assume 50% of excess air for combustion. (5)

b) Briefly write on Indian nuclear programme (5)

Q5 a) What is Neutron scattering? How it is influence the reactor design?. (5)

b) Explain different types of reactor s and the various applications. (5)

Q6 Explain the working of nuclear reactors and the safety system precautionary steps taken in a reactor. (10)

Q7 a) What do you mean by cogeneration? What are the reasons for promoting cogeneration in decentralized environment- discuss. (5)

b) Write short notes on environmental aspects of power generation using fossil fuel based power plant. (5)

Q8 Write short notes (any two) (5+5)

a) Deaerator and drain cooler
b) Feedwater treatment
c) Future trends in reactor design