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M.TECH

Total Number of Pages : 1

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018

THERMAL AND NUCLEAR POWER PLANT

Branch: TE, Subject Code: MTEPE1042

(Regulations 2018)

Time: 3 Hours

Max Marks : 70

Question Code:RD18002081

PART-A (10 X 2=20 Marks)

1. Answer the following questions.
 - a. Draw T-S and P-h diagram of Rankine cycle.
 - b. What is the function of Deaerator?
 - c. What is the necessity of draft systems in a power plant?
 - d. Define load factor and capacity factor.
 - e. What do you mean by radioactive decay?
 - f. Explain neutron scattering.
 - g. What is the advantage of regenerative feed water heating?
 - h. Calculate the binding energy of 0.5 a.m.u. mass of nucleus.
 - i. Calculate the decay constant of Thorium 233 if the half life is 22.1 min.
 - j. Define breeding ratio and circulation ratio.

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

- 2.a)What are the different types of stokers used in a thermal power plant? Explain one with neat diagram? [5]
 - b)Calculate the overall efficiency of a power plant using the efficiencies of boiler, cycle, turbine and generator. [5]
 - 3.a)What do you mean by once through systems and write its contribution towards environment aspects of power generation? [5]
 - b) Explain the operation of an elastic precipitator. [5]
 - 4.a) Describe any water tube boiler used in steam power plant with neat sketch. [5]
 - b)With neat sketch describe different types of super heaters used for boilers. [5]
 - 5 a) Briefly explain the Feed water treatment process used in thermal power plant? [5]
 - b) Describe different methods of controlling the super-heater temperature. [5]
 - 6.a) Explain the working principle of CANDU reactor with suitable diagram. [5]
 - b) Calculate the binding energy per nucleon for the Helium atom given below. [5]
- $$2\text{}^1_0\text{n} + 2\text{}^1_1\text{p} \rightarrow \text{}^4_2\text{He}$$
- Atomic masses of Helium = 4.00387 a.m.u., proton = 1.00759, neutron = 1.00898 a.m.u. and electron = 0.0055 a.m.u.
- 7.a)What do you mean by co-generation system? Briefly explain pass-out and condensing turbine? [5]
 - b) Explain radio activity. [5]
 8. Write short notes on :
 - a) Reactor Core design [5]
 - b) Energy scenario in India [5]