

Code No:158DA

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech IV Year II Semester Examinations, July/August - 2022

BASICS OF POWER PLANT ENGINEERING

(Common to CE, ME, ECE)

Time: 3 Hours

Max.Marks:75

Answer any five questions
All questions carry equal marks

- 1.a) Draw P-h and T-s diagrams for Rankine cycle used for the operation of steam power plant unit and explain its principle of operation along with the equation for thermal efficiency.
- b) Describe the fuel and ash handling circuits used in thermal power plant by drawing the flow chart of the processes. [8+7]
- 2.a) Why draught is necessary in steam power plant? Explain how the natural draught is created.
- b) Explain the method of treatment of water used in thermal power plants along with its importance. [8+7]
- 3.a) What is the basic operating cycle for the operation of gas turbine power plants? Explain its principle of operation with a schematic diagram.
- b) What are the components required for integrated gasifier based combined cycle power generation system? Explain them. [8+7]
- 4.a) Draw the schematic diagram of simple combined cycle power generation unit and discuss their advantages and limitations.
- b) How to optimize the Brayton cycle based network output? Discuss the salient points. [8+7]
- 5.a) What are different safety measures to be taken for the operation of nuclear power plants? Explain in detail.
- b) Differentiate between nuclear fission and nuclear fusion and which process is more efficient? [8+7]
- 6.a) Draw the simple diagram for fast breeder reactor used in nuclear thermal power plant and explain its constructional and operational features.
- b) Explain the advantages and limitations of gas cooled and liquid cooled reactors used in Nuclear power plants. [8+7]
- 7.a) Explain the principle of operation of tidal power generation unit along with a suitable diagram and discuss their limitations.
- b) How to make use of the solar energy effectively in power generation sector? Why it has become major energy resource for future? Justify. [8+7]
- 8.a) What are different operating costs involved in power generation system? How they arrive the unit cost of power generation? Explain.
- b) How to dispose the waste from nuclear power plants? Explain different problems associated during disposal. [8+7]

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