



Answer the following questions. Use of steam tables and charts are allowed. Assume any necessary assumptions.

Question No. 1 (25 marks)

- | | Marks |
|---|--------------|
| a) How are steam power plants classified? | [5] |
| b) What factors should be taken into consideration while selecting the site for steam power plant? | [5] |
| c) Steam expands from 160 bar, 500 °C to 0.06 bar in a steam power plant. Compare the plant efficiencies, heat rates and dryness fractions of the exhaust steam for reheat pressures 80 bar, 10 and 1 bar. Assume isentropic expansion. | [15] |

Question No. 2 (35 marks)

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|---|------|
| a) What are factors which should be considered while selecting the site for hydro-electrical power plant. And compare between hydro and thermal power plants. | [10] |
| b) What are the main components of a nuclear reactor? | [4] |
| c) List the advantages and disadvantages of a pressurized Water Reactor(PWR) | [5] |
| d) A 200 MW steam turbine power plant, employing regenerative feed heating cycle, has the following data: Steam conditions at inlet are 80 bar and 510°C for pressure and temperature, respectively. Condenser pressure is 0.1 bar, bleed points are at pressures of 25, 10 and 2 bar. Assume the same expansions efficiencies in the turbine stages of 85%. Draw T-S diagram of the cycle, and determine:
i) mass of steam raised in the boiler per kg of steam condensed in the condenser,
ii) capacity of boiler in kg of steam per hour, and
iii) improvement in the thermal efficiency due to feed heating. | [16] |

Question No. 3 (30 marks)

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| a) Explain with help of neat diagram a wind electric generating power plant. | [8] |
| b) What are the problems of operating large wind power generators. | [5] |
| c) Give the classification of tidal power plants. | [5] |
| d) What are the advantages and limitations of tidal power generation? | [5] |
| e) What are the advantages of mechanical and steam jet draughts. | [7] |

Question No. 4 (20 marks)

- a) Explain with the help of a neat diagram a solar pond electric power plant. [10]
- b) List five general categories of geothermal sources. [4]
- c) What are the main applications of geothermal energy and give list the advantages and disadvantages of it? [6]
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Good luck,

Dr. A. Abd Elsalam