

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Regular Examination June 2023 (2019 Scheme)

Course Code: MET478**Course Name: POWER PLANT ENGINEERING****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

Marks

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|----|---|-----|
| 1 | Explain the purpose of boiler draught. How is it classified? | (3) |
| 2 | Outline the characteristics of a supercritical boiler. Give an example. | (3) |
| 3 | Explain the different operations of Brayton Cycle. | (3) |
| 4 | List the essential components of diesel power plant. | (3) |
| 5 | List and explain any two nuclear fuels used in a nuclear reactor. | (3) |
| 6 | List four advantages of nuclear power plants. | (3) |
| 7 | Explain the characteristics of wind energy. | (3) |
| 8 | List out various applications of geothermal energy. | (3) |
| 9 | Define demand factor and load factor. Mention its significance. | (3) |
| 10 | Illustrate a load curve with the help of a neat sketch. | (3) |

PART B*Answer any one full question from each module, each carries 14 marks.***Module I**

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|----|---|------|
| 11 | a) With a neat sketch explain the layout of a modern steam power plant. | (10) |
| | b) Explain steam rate and heat rate. | (4) |

OR

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|----|---|-----|
| 12 | a) Explain the steps to be followed for coal handling in a thermal power plant. | (8) |
| | b) Illustrate and briefly describe the working of cooling tower. | (6) |

Module II

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|----|--|-----|
| 13 | a) Explain combined cycle power plant. Illustrate any three design combination of gas turbine and steam power plant. | (9) |
| | b) List the advantages and disadvantages of gas turbine power plant over diesel power plant. | (5) |

OR

- 14 a) Explain the importance of lubrication system in diesel power plant Write short notes on (10)
- i. Dry sump lubrication system
 - ii. Wet sump lubrication system
- b) List any four applications of a gas turbine power plant. (4)

Module III

- 15 a) Explain the working principle of CANDU reactor with the help of a neat sketch and write down its important characteristics. (10)
- b) Outline the significance of coolant in nuclear reactor. List the desirable properties of good coolant. (4)

OR

- 16 a) With the aid of a sketch show all the important parts of a nuclear reactor, describing briefly the functions of each part. (10)
- b) Explain breeder reactor. State its advantages. (4)

Module IV

- 17 a) Draw and explain two basic design of ocean thermal energy conversion (OTEC) (10)
- i. Open cycle (or) Claude cycle.
 - ii. Closed cycle (or) Anderson cycle.
- b) Explain the working principle of 'photovoltaic solar energy conversion'. (4)

OR

- 18 a) With a neat layout diagram explain the components and working of hydro power plant. (10)
- b) List out various guidelines for fixing optimum size of a biogas plant. (4)

Module V

- 19 a) Summarize various capital and operational cost to be considered in the cost analysis of a power plant. (9)
- b) Explain the various factors to be considered while selecting the location of a power plant. (5)

OR

- 20 a) A generation station of 96 MW capacity has a daily load curve with the following demands: (9)

Time	12 am- 6 am	6am- 5 pm	5 pm – 7 pm	7pm- 9 pm	9pm-10 pm	10pm-12am
Load (MW)	48	30	72	86	84	60

1. Plot the daily load curve and the load duration curve.
2. Find the load factor, the reserve capacity and plant capacity factor.

b) Define tariff. Explain any one type of tariff.

(5)
