

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV / DEC 2025

Seventh Semester

Electrical and Electronics Engineering**20EEPC701 - DISTRIBUTED GENERATION AND MICROGRID**

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

- | | <i>Marks</i> | <i>K – Level</i> | <i>CO</i> |
|--|--------------|------------------|-----------|
| 1. The Device which is used to measure the wind speed is
(a) Anemometer (b) Thermometer (c) Tachometer (d) Speedometer | 1 | K1 | CO1 |
| 2. The wind speed at which the wind turbine must be shut down to avoid damage to the turbine is known as _____ speed.
a) cut out wind (b) rated wind (c) synchronous (d) cut in wind | 1 | K1 | CO1 |
| 3. Which of the following components is essential in a central receiver power plant?
(a) parabolic trough (b) heliostats (c) flat-plate collector (d) solar pond | 1 | K1 | CO2 |
| 4. The Unit of solar irradiance is
(a) W/m ² (b) J/s (c) KWh/s (d) J/m | 1 | K1 | CO2 |
| 5. The term biomass most commonly refers to
(a) inorganic matter (b) chemicals (c) ammonium compounds (d) organic matter | 1 | K1 | CO3 |
| 6. What is the movement of water generated by associated with the change in mean sea level called?
(a) tidal variation (b) tidal volume (c) tidal range (d) tidal current | 1 | K1 | CO3 |
| 7. Match the type of energy storage
Chemical 1. Flywheel
Mechanical 2. Battery
Electrochemical 3. Fuel cell
Electromagnetic 4. Superconducting magnetic energy storage
(a) a-2, b-3, c-1, d-4 (b) a-3, b-2, c-1, d-4 (c) a-3, b-1, c-2, d-4 (d) a-4, b-3, c-1, d-2 | 1 | K1 | CO4 |
| 8. IEEE Standard 1547.3-2007 “IEEE Guide for
(a) Monitoring (b) Resources Interconnected with Electric Power Systems
(c) All of these (d) Information Exchange and Control of Distributed | 1 | K1 | CO4 |
| 9. The microgrid systems are usually prepared to work in
(a) grid-connected variation (b) islanded volume (c) isolated range (d) all of these | 1 | K1 | CO5 |
| 10. To ensure a reliable and economical operation, Microgrid have to include
(a) own generating units (renewables, diesel, microturbine, fuel cell)
(b) storage system (batteries, pumped-storage hydroelectricity, supercapacitors)
(c) smart management system to ensure the continuous balance between electricity generation and demand
(d) all of the above | 1 | K1 | CO5 |

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

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| 11. Compare drag force and lift force. | 2 | K2 | CO1 |
| 12. What are the classifications of wind turbines? | 2 | K1 | CO1 |

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|--|---|----|-----|
| 13. Draw the I-V and P-V characteristics of solar cell. | 2 | K1 | CO2 |
| 14. What is the need of boost converter in solar photovoltaic system? | 2 | K1 | CO2 |
| 15. Mention some types of fuels used in biomass plant. | 2 | K1 | CO3 |
| 16. List the classification of energy storage system. | 2 | K1 | CO3 |
| 17. Recall the importance of IEEE1547 standards. | 2 | K1 | CO4 |
| 18. What are the requirements of grid interconnection? | 2 | K1 | CO4 |
| 19. List the function of energy management module in micro grid configuration. | 2 | K1 | CO5 |
| 20. What is point of common coupling? | 2 | K1 | CO5 |
| 21. Recall islanding techniques and its types. | 2 | K1 | CO4 |
| 22. Define Black start. | 2 | K1 | CO5 |

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

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|---|----|----|-----|
| 23. a) Summarize briefly the various components of WPPs. | 11 | K2 | CO1 |
| OR | | | |
| b) Explain the controlling system of WPPs and its classification. Explain any two types in detail. | 11 | K2 | CO1 |
| 24. a) Outline in detail the central receiver power plants with a neat block diagram. | 11 | K2 | CO2 |
| OR | | | |
| b) With the help of flow chart, explain the perturb and observe the MPPT algorithm. | 11 | K2 | CO2 |
| 25. a) Illustrate briefly about the switched configuration of Diesel- PV hybrid system. | 11 | K2 | CO3 |
| OR | | | |
| b) Explain the concept of electrical power generation from biomass. | 11 | K2 | CO3 |
| 26. a) Outline the impact of grid integration with NCE sources on existing power system. | 11 | K2 | CO4 |
| OR | | | |
| b) Explain in detail the different capacitive power plant used for ESS and list its advantages and disadvantages. | 11 | K2 | CO4 |
| 27. a) Summarize in detail the typical architecture of microgrid and compare it with utility power grid. | 11 | K2 | CO5 |
| OR | | | |
| b) Classify the different topologies of the power electronic interface in AC microgrid. | 11 | K2 | CO5 |
| 28. a) Explain in detail with a neat diagram about islanding techniques involved in grid and its issues. | 11 | K2 | CO4 |
| OR | | | |
| b) Illustrate in detail about Fly wheel and Ultra capacitor with neat diagram. | 11 | K2 | CO4 |