



M.E DEGREE EXAMINATIONS: NOV/DEC 2016

(Regulation 2015)

Third Semester

POWER ELECTRONICS AND DRIVES

P15PETE08: Power Electronics in Wind and Solar Power Conversion

COURSE OUTCOMES

CO1: Choose a power converter for the control and conversion of wind and solar energy.

CO2: Use the skills, modern engineering tools necessary for engineering practice.

CO3: Design a system, component or process to meet desired needs.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Arrange the following based on installed capacity of Renewable energy in India in descending order A)Wind energy B) Hydro energy C) solar energy CO₂ [K₂]
 - a) B,C,A b) A,C,B
 - c) C,B,A d) C,A,B
2. The secondary sources are A) steam B) Thermal C) Coal CO₂ [K₂]
 - a) A is true and B,C are false b) Both A and C are true
 - c) Both A and B are true d) All are true
3. Solar radiation is measured using CO₁ [K₃]
 - a) Encoder b) Pyranometer
 - c) Pyroheliometer d) Both (b) and (c)
4. Match the following type of cells with their efficiencies (Approximately) CO₁ [K₂]

List I	List II
A. polycrystalline	i. 7-13%
B. Mono crystalline	ii. 13% to 16%
C. Thin film	iii. up to 8%
D. Amorphous	iv. 15% to 20%

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|--|-----|-------------------|
| 14. Draw the VI characteristics of solar cell with Maximum power point. | CO1 | [K ₂] |
| 15. What are all the DC-DC converters used for solar energy conversion? Why? | CO1 | [K ₂] |
| 16. Classify Wind energy conversion system. | CO1 | [K ₂] |
| 17. What is coefficient of performance? | CO2 | [K ₁] |
| 18. How to achieve the power control in wound rotor induction generator? | CO2 | [K ₂] |
| 19. List the wind farm accessories. | CO1 | [K ₂] |
| 20. How to obtain variable speed variable frequency generation in WECS? | CO1 | [K ₁] |

PART C (6 x 5 = 30 Marks)

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| 21. List some rules and regulations of MNRE in energy consumption. | CO2 | [K ₃] |
| 22. What is the need of Maximum power point tracking in solar system? Explain. | CO1 | [K ₂] |
| 23. What are all the applications of solar energy conversion? Explain any one in detail | CO2 | [K ₂] |
| 24. Draw the energy path from Wind farm to end user and explain. | CO2 | [K ₃] |
| 25. Explain the methods in grid connected wind energy conversion system. | CO1 | [K ₂] |
| 26. What are all the schemes for electric generation in Wind energy conversion system? Explain in detail. | CO1 | [K ₂] |

Answer any FOUR Questions
PART D (4 x 10 = 40 Marks)

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| 27. Explain different energy sources and their availability in India. | CO2 | [K ₂] |
| 28. Explain the solar energy system with DC-DC converter. | CO1 | [K ₂] |
| 29. Explain the interfacing issues of wind energy and solar energy systems with grid. | CO1 | [K ₂] |
| 30. Explain the components of wind energy conversion system with neat diagram. | CO1 | [K ₂] |

31. What are the different types of cogeneration processes available and compare them based on their performance and efficiencies. CO3 [K₁]
