


B.E DEGREE EXAMINATIONS: MAY 2018

(Regulation 2015)

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U15EET601 : Generation of Electrical Energy

COURSE OUTCOMES

- CO1:** Understand the economics of various power generation systems
CO2: Explain and demonstrate the technological basis for various conventional energy sources
CO3: Understand the techniques for harnessing solar energy
CO4: Have the knowledge of Micro Grid and Distributed Generation
CO5: Apply the knowledge of wind energy conversion system and selection criteria
CO6: Extend the basic idea and importance of environmental issues to conventional and non conventional energy sources

Time: Three Hours**Maximum Marks: 100**
**Answer all the Questions:-
 PART A (10 x 1 = 10 Marks)**

1. Match the following.

CO1 [K₂]

List I		List II	
A. Load factor		i. Greater than one	
B. Diversity factor		ii. Less than one	
C. Load curve		iii. To determine the capacity of the plant	
D. Demand factor		iv. To determine load factor	

- | | A | B | C | D |
|----|-----|----|-----|-----|
| a) | ii | i | iii | iv |
| b) | iii | iv | ii | i |
| c) | ii | iv | iii | i |
| d) | ii | i | iv | iii |

2. The number of units generated will be more if the load factor is

CO1 [K₂]

- | | |
|----------|-------------|
| a) Small | b) More |
| c) Zero | d) Negative |

3. The cheapest plant in operation and maintenance is _____ plant.

CO2 [K₂]

- | | |
|------------------|---------------------|
| a) Steam power | b) Hydro-electric |
| c) Nuclear power | d) Geothermal power |

4. Of all plants, minimum quantity of fuel is required in _____ plant. CO6 [K₂]
 a) Nuclear power b) Diesel power
 c) Steam power d) Geothermal power
5. Energy is radiated by the sun as electromagnetic waves of which 99% have wave lengths in the range of _____. CO3 [K₁]
 a) 0.2 to 4.0 μm b) 0.1 to 4.0 μm
 c) 0.4 to 4.0 μm d) 0 to 4.0 μm
6. Solar radiation received in one day is CO3 [K₁]
 a) 429.2 Btu / square feet /hr b) 429.2 Btu / square m / hr
 c) 429.2 Btu / square km /hr d) 429.2 Btu / square feet /day
7. _____ is the angle between the relative air flow and the closed of the airfoil. CO5 [K₂]
 a) Pitch angle b) Angle of attack
 c) Aero dynamics d) Camber
8. _____ is the angle between the direction of wind and the direction perpendicular to the planes of blades. CO5 [K₂]
 a) Pitch angle b) Angle of attack
 c) Aero dynamics d) Camber
9. When a live conductor of public electric supply breaks down and touches the earth, which of the following will happen? CO4 [K₂]
 a) Current will flow to earth b) Supply voltage will drop
 c) Supply voltage will increase d) No current will flow in the conductor
10. Assertion (A): Residential conventional PV systems (Grid-tied) are not micro grids but they are distributed generation systems. CO4 [K₃]
 Reason (R): They cannot operate isolated from the grid. If the grid experiences a power outage the load cannot be powered even when the sun is shining bright on the sky.
 a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A
 c) A is true but R is false d) A is false but R is true

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11. List the important advantages of High Load factor. CO1 [K₂]
12. Differentiate Load duration curve with Load curve. CO1 [K₂]

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|--|-----|-------------------|
| 13. Why is the overall efficiency of steam power station very low? | CO6 | [K ₂] |
| 14. Explain the role of condenser in steam power plant. | CO2 | [K ₂] |
| 15. State the major drawbacks of the extensive application of Solar Energy. | CO3 | [K ₃] |
| 16. List the information to be retrieved from solar radiation data. | CO3 | [K ₃] |
| 17. What are the factors that determine the output from a wind energy converter? | CO5 | [K ₃] |
| 18. List the disadvantages of mono blade horizontal axis wind turbine. | CO5 | [K ₂] |
| 19. Summarize the merits of Micro grid concepts. | CO4 | [K ₂] |
| 20. What is state estimation? | CO4 | [K ₁] |

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

- | | | |
|--|-----|-------------------|
| 21. Compare the performance and operation of horizontal axis wind machine with vertical axis wind machine. | CO5 | [K ₃] |
| 22. What are the characteristics of typical system load and list the various load devices? | CO1 | [K ₂] |
| 23. Compare the Hydro, Diesel and Nuclear power plants based on the following
(i) site (ii) Initial cost (iii) running cost (iv) source of power (v) transportation and
(vi) cleanliness | CO2 | [K ₃] |
| 24. With suitable diagrams, explain the basic components and their function and discuss the advantages of flat plate collector. | CO3 | [K ₃] |
| 25. Explain with neat sketch the working of MHD Power plant. | CO2 | [K ₂] |
| 26. Discuss the role of economics in plant selection for Steam power plant, Hydro electric power plant and Gas Turbine power plant. | CO1 | [K ₃] |
| 27. Compare the Pros and Cons of Centralized, Decentralized and Distributed control of Micro grids. | CO4 | [K ₃] |
