



**B.E/B.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023**

(Regulation 2018)

Fourth Semester

**ELECTRICAL AND ELECTRONICS ENGINEERING**

U18EET4002: Generation, Transmission and Distribution

**COURSE OUTCOMES**

- CO1:** Understand the principles of power generation utilizing various conventional energy Sources.
- CO2:** Impart the knowledge of generation of electricity based on various Non-conventional. energy sources and study the PV module characteristics using modern software tools.
- CO3:** Analyze the essential components of transmission line modeling and its performance.
- CO4:** Describe and select the configurations of different line insulators and cables.
- CO5:** Acquire knowledge on different types of distribution systems.

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 2 = 20 Marks)**

**(Answer not more than 40 words)**

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|--|-----|-------------------|
| 1. What is the function of alternator in a generating station?   | CO1 | [K <sub>1</sub> ] |
| 2. What is the function of surge tank in hydroelectric power station?  | CO1 | [K <sub>1</sub> ] |
| 3. List any two advantages of non-conventional energy sources.   | COL | [K <sub>1</sub> ] |
| 4. What is a fuel cell?  | COL | [K <sub>1</sub> ] |
| 5. Recall the lengths of short and long transmission lines.  | COL | [K <sub>1</sub> ] |
| 6. Define skin effect.   | COL | [K <sub>1</sub> ] |
| 7. Define string efficiency.   | COL | [K <sub>1</sub> ] |
| 8. List the types of insulators.   | COL | [K <sub>1</sub> ] |
| 9. State True or False.  | COL | [K <sub>1</sub> ] |
| i. A ring main distributor fed at one end is equivalent to straight distributor fed at both ends with unequal voltages.            |     |                   |
| ii. The point of minimum potential of a uniformly loaded distributor fed at both ends with equal voltages will occur at mid-point. |     |                   |
| 10. In residential buildings which type of 3 phase system is used?   | COL | [K <sub>2</sub> ] |

**Answer any FIVE Questions:-**  
**PART B (5 x 16 = 80 Marks)**  
**(Answer not more than 400 words)**

11. a) Draw the schematic diagram of gas turbine power plant and explain the main parts. (10) CO1 [K<sub>2</sub>]
- b) State the advantages and disadvantages of thermal power stations. (6) CO1 [K<sub>2</sub>]
12. a) Explain about the environmental impacts of solar energy generation. (8) CO2 [K<sub>2</sub>]
- b) Draw a schematic for hybrid wind-solar energy system and explain its operations. (8) CO2 [K<sub>2</sub>]
13. a) Draw the basic structure of electrical power system and explain. (8) CO3 [K<sub>1</sub>]
- b) A single phase 10 km line is 8 m above the ground. The diameter of the conductors is 2 cm and is separated by 4 m horizontally. Find:
- i. Capacitance between conductors
  - ii. Capacitance between phase and neutral plane
  - iii. Capacitance when effect of ground is neglected
  - iv. Charging current when the line is charged at 33 kV, 50Hz supply.
14. a) Derive the expression for the capacitance of a single core cable. (8) CO4 [K<sub>2</sub>]
- b) Explain capacitance grading. Mention its disadvantages. (8) CO4 [K<sub>2</sub>]
15. a) Derive an expression for the voltage drop for a uniformly loaded distributor fed at one end. (8) CO5 [K<sub>2</sub>]
- b) Write short notes on ring main distribution system. (8) CO5 [K<sub>1</sub>]
16. a) Explain the factors for selecting the site for a nuclear power plant. (8) CO1 [K<sub>2</sub>]
- b) How will you improve the string efficiency using guard rings? (8) CO4 [K<sub>2</sub>]

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