| Seat No.: | | Q. Paper Code: FTC-A-019 | SET | A |
|---|---|---|---|---|

**Fabtech Technical Campus, College of Engineering & Research, Sangola**

(An Autonomous Institute)

**Electrical Engineering**

**Academic Year: -2025-26, Semester-I**

## EHVAC Transmission System (25PEE11271)

## Regular End Semester Examination Winter 2025-26 [Dec./Jan]

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|---|---|---|---|
| **Class:** | F. Y. M. Tech. | **Day & Date:** | Wednesday, 07/01/2026 |
| **Duration:** | 03 Hrs. | **Max. Marks:** | 60 Marks |
| **Time:** | 11.00 AM TO 2.00 PM | | |

**Instructions:**

1) All Questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagram wherever necessary.
4) Make suitable assumptions if necessary and state it clearly.
5) Use of non-programmable calculator is allowed.

| Q. No. | Questions | Marks | CO | BL |
|---|---|---|---|---|
| **Q. 1** | **Attempt any two of the following** | **12** | | |
| **1** | Explain the necessity of EHV AC transmission | **6** | 1 | 2 |
| **2** | Why is EHVAC transmission necessary in modern power systems? | **6** | 1 | 2 |
| **3** | What are the key properties of bundled conductors in EHVAC lines? | **6** | 1 | 2 |
| **Q. 2** | **Attempt any two of the following** | **12** | | |
| **1** | Define surface voltage gradient and explain its significance in EHV line design. | **6** | 2 | 2 |
| **2** | For a system of two or more parallel conductors, derive the charge–potential relationship using the capacitance matrix method. | **6** | 2 | 4 |
| **3** | Explain surface voltage gradient on conductors. | **6** | 2 | 2 |
| **Q. 3** | **Attempt any two of the following** | **12** | | |
| **1** | Explain the measurement techniques for RI, RIV, and excitation functions in EHV lines.. | **6** | 3 | 2 |
| **2** | Discuss the generation and characteristics of audible noise (AN) in EHVAC lines | **6** | 3 | 2 |
| **3** | Explain the phenomenon of corona in EHVAC transmission lines. | **6** | 3 | 3 |
| **Q. 4** | **Attempt any two of the following** | **12** | | |

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|---|---|---|---|---|
| **1** | Discuss the biological effects of electrostatic fields from EHVAC lines on humans, animals, and plants. | **6** | 4 | 3 |
| **2** | Derive the wave equation for a traveling wave on a lossless transmission line. | **6** | 4 | 3 |
| **3** | Explain the method of calculating electrostatic fields of EHVAC transmission lines. | **6** | 4 | 2 |
| **Q. 5** | **Attempt any two of the following** | **12** | | |
| **1** | What is subsynchronous resonance (SSR) in the context of series capacitor compensation? | **6** | 5 | 3 |
| **2** | Describe the cascade connection of shunt and series compensation in a transmission line. | **6** | 5 | 4 |
| **3** | Explain how synchronous condensers are used for voltage control in EHVAC systems | **6** | 5 | 2 |