# ANURAG Engineering College
## (An Autonomous Institution)
### IV B.Tech II Semester Regular/Supplementary Examinations, April – 2024
### EHV AC Transmission
### (ELECTRICAL AND ELECTRONICS ENGINEERING)

**Time: 3 Hours**          **Max.Marks:75**

## Section – A (Short Answer type questions)      (25 Marks)
**Answer All Questions**

| | | Course Outcome | B.T Level | Marks |
|---|---|---|---|---|
| 1. | What are power handling capacity and line losses? | CO1 | L1 | 2M |
| 2. | Explain about Galloping process in EHVAC transmission system. | CO1 | L2 | 3M |
| 3. | What is field of sphere gap? | CO2 | L1 | 2M |
| 4. | Briefly explain about surface voltage gradient on conductors. | CO2 | L2 | 3M |
| 5. | What are the factors affecting corona loss? | CO3 | L1 | 2M |
| 6. | Write about generation characteristics, limits & measurements of AN. | CO3 | L2 | 3M |
| 7. | What are the different sources of excitation? | CO4 | L1 | 2M |
| 8. | Explain briefly lumped parameters of distributed lines. | CO4 | L2 | 3M |
| 9. | What are the uses of a power circle diagram? | CO5 | L1 | 2M |
| 10. | Explain the cascade connection of shunt and series compensation. | CO5 | L2 | 3M |

## Section B (Essay Questions)
**Answer all questions, each question carries equal marks.**      (5 x 10M = 50M)

| | | Course Outcome | B.T Level | Marks |
|---|---|---|---|---|
| 11.A) | What are bundle conductors? Write the properties of it and derive the Geometrical Mean Radius of bundle conductors. | CO1 | L3 | 10M |
| | **OR** | | | |
| B) | Explain in detail capacitances and inductances of ground return and derive necessary expressions. | CO1 | L3 | 10M |
| 12.A) | A charge of 10 μC is placed at a distance of 2 m from the center of a sphere of radius 0.5 m. Calculate the magnitude, polarity and location of point charge Q2 which will make the sphere at zero potential. | CO2 | L3 | 10M |
| | **OR** | | | |
| B) | Explain about Surface Voltage Gradient on bundle conductor. | CO2 | L3 | 10M |
| 13.A) | Illustrate about frequency spectrum of the RI field of line in E.H.V. lines. | CO3 | L3 | 10M |
| | **OR** | | | |
| B) | Explain the corona pulses, their generation and properties. | CO3 | L3 | 10M |
| 14.A) | Describe the electrostatic fields of double circuit 3-phase EHV AC line. | CO4 | L3 | 10M |
| | **OR** | | | |
| B) | Explain the effect of Electrostatic fields to human life, plants and animals. | CO4 | L3 | 10M |
| 15.A) | Explain the voltage control using synchronous condensers. | CO5 | L3 | 10M |
| | **OR** | | | |
| B) | A 420 kV line is 750 km long. Its inductance and capacitance per km are $L = 1.5$ mH/km and $C = 10.5$ nF/km. The voltages at the two ends are to be held 420 kV at no load. Neglect resistance. Calculate the MVAR of shunt reactors to be provided at the two ends and at intermediate station midway with all four reactors having equal resistance. | CO5 | L3 | 10M |