Code No: R1631021 **R16** SET - 1

III B. Tech I Semester Supplementary Examinations, May - 2019

POWER SYSTEMS–II

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) What is the effect of earth on line capacitance? [2M]
   b) What is the significance of a T- model and π – model of a transmission line? [3M]
   c) What is the significance of line efficiency and line regulation? [2M]
   d) What do you mean by the terms reflection coefficient and refraction coefficient? [3M]
   e) How the Corona Phenomena occurs in transmission lines. [2M]
   f) What is the effect of wind on Sag calculations [2M]

PART -B

2. a) Explain with reason why the Bundled - Conductor lines have lower inductance than Single- conductor lines of the same area of Cross section. [7M]
   b) The conductors in a Single – phase transmission line are 6m above the ground. Each conductor is 15 mm diameter and spacing between them is 2.5 m. Calculate i) the capacitance per Km of the line neglecting the effect of Ground. ii) the capacitance per Km of the line taking in to the effect of ground, and iii) percentage increase in capacitance due to the presence of ground. [7M]

3. A three – phase over - head transmission line , 80 Km long delivers 24 MVA at 66 KV, 50 Hz, 0.8 power factor lagging. The line conductors have a diameter of 1.5 cm and are symmetrically spaced at a distance of 2.5 m. Determine the regulation and efficiency of the line, using the nominal π method. The line resistance is 8.72 Ω / phase. [14M]

4. a) Explain in detail about the Surge impedance loading of Long transmission lines. [7M]
   b) Explain in detail about Wave length and Velocity of Propagation of a long transmission line. [7M]

5. a) Derive the expression for travelling wave of a transmission lines [7M]
   b) A step wave of 200 KV travels on a line having surge impedance of 500 ohms and reaches the end of the line where the line is terminated by an inductance of 2500μH. Find the voltage across the inductance. [7M]

6. a) Explain how shunt reactors can eliminate the Ferranti effect in transmission lines. [7M]
   b) A 3-phase, 50 Hz, 144 kV transmission line has conductors in equilateral formation spaced 2.2 metres apart. The conductor diameter is 1.02 cm and the surface factor is 0.86. The air pressure and temperature are 76 cm of Hg and 28°C respectively. Determine the critical visual voltage for corona and the corona loss per km per phase of the line, mv = 0.75. [7M]

7. a) Explain the static shielding of Insulators String. [7M]
   b) Derive the expressions for sag and tension when the supports are at unequal heights. [7M]

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