**R13**

**Code No: 115AG**

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
### B.Tech III Year I Semester Examinations, February/March - 2016
### POWER SYSTEMS-II
### (Electrical and Electronics Engineering)

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

**Note:** This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

### Part- A
**(25 Marks)**

1.a) What are the different types of conductors? [2]
  b) Briefly explain about the effect of ground on capacitance. [3]
  c) Draw the nominal T model of a transmission line. [2]
  d) Explain about surge impedance loading. [3]
  e) Define Ferranti effect. [2]
  f) Write the difference between reflection and refraction. [3]
  g) Define stringing chart. [2]
  h) How to improve sting efficiency? [3]
  i) What are the different types of cables? [2]
  j) What is the need for underground cables? [3]

### Part-B
**(50 Marks)**

2.a) Derive the inductance of 2-wire transmission line.
  b) In a 3 phase transmission line the 3 conductors are place at the corners of a triangle of sides 2m, 3m and 2.5m. If the diameter of each conductor is 1.6cm and conductors are regularly transposed, calculate the inductance per phase per kilometer. [5+5]

**OR**

3.a) Derive the capacitance of single phase two wire line.
  b) Derive the capacitance of 3 phase symmetrical transmission line. [5+5]

4.a) Derive the A, B, C and D constants for Nominal-Pie model.
  b) A single phase over head transmission line is transmitting 1200kW power to factory at 11kV at 0.8 P.F lag. The line resistance and loop reactance of the line are 3ohm and 5ohm phase. Determine i) Source voltage ii) Percentage regulation iii) Efficiency.[5+5]

**OR**

5. Derive the A, B, C and D constants of long transmission lines using Rigorous solution. [10]

6.a) Explain about termination of line with open circuit for travelling wave.
  b) Explain about proximity effect.
  c) Give brief about power loss due to corona. [3+3+4]

**OR**

7.a) Derive an expression for travelling wave in a power system.
  b) Explain about Bewley's Lattice Diagram. [5+5]

8.a) Derive the sag expression for a transmission line at equal level supports
  b) An overhead transmission line has a span of 220m, the conductor weighing 804kg/km. Calculate the maximum sag if the ultimate tensile strength of the conductor is 5,758kg. Assume safety factor 2. [5+5]

**OR**

9.a) Obtain the mathematical expression for potential distribution over a string of suspension type insulators.
  b) In a string of 3 units, the capacitance between each link to pin to earth is 11% of the capacitance of one unit. Calculate the voltage across each unit and string efficiency when the voltage across the string is 33kV. [5+5]

10.a) Explain about capacitance of a 3 phase belted cable.
  b) Explain about inter-sheath grading of cables. [5+5]

**OR**

11.a) With neat sketch explain about construction of underground cable.
  b) Explain about high tension cables. [5+5]

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