JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, September - 2021
**POWER SYSTEM – II**
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
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1.a) Explain the Ferranti effect with a phasor diagram and its causes.
  b) Explain the classification of lines based on their length of transmission.   [8+7]

2.a) What are the factors which govern the performance of a transmission line?
  b) What is an equivalent π circuit of long line? Derive expression for parameters of this circuit in terms of line parameters.   [6+9]

3.a) Describe about shunt and capacitors role in voltage control.
  b) Discuss about tap changing transformers used for voltage control.   [8+7]

4.a) What is difference between compensated and uncompensated transmission line?
  b) Describe about radial line with asynchronous load.   [8+7]

5.a) What is per unit system and list its advantages?
  b) Draw the impedance diagram for the electric power system shown in figure showing all impedances in per unit on a 100 MVA base. Choose 12 kV as the voltage base for generator. Three phase power and line ratings are as below:
   G1:90MVA, 12kV, X=9%
   T1:80MVA, 12/220kV, X=16%
   T2:80MVA, 220/7.2kV, X=20%
   G2:90MVA, 7.2kV, X=9%
   Line:220kV, X=120Ω
   Load Bus:220kV,S=48MW+j64MVAr   [6+9]
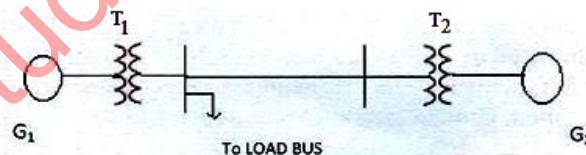
6.a) Determine the equations for the reflection and refraction coefficients for a short circuited line.
  b) A surge of 200 KV travelling on a line of surge impedance 400Ω reaches a junction of the line with two branch lines of surge impedance of 500Ω and 300Ω respectively. Find the surge voltage and current transmitted into each branch line.   [8+7]

7. What is insulation coordination and describe its significance in selection of protective equipment? Explain with volt-time characteristics.   [15]

8.a) Find symmetrical components for the given three phase voltages:
   $V_a = 300\lfloor-120°, V_b = 200\lfloor90°$ and $V_c = 100\lfloor-30°$
  b) Develop the connection diagram of sequence network when a line to line fault occurs in a power network.   [8+7]

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