CLASS: BE   SEMESTER: VI/ADD
BRANCH: EEE   SESSION: SP/2020

SUBJECT: EE6203 POWER SYSTEM II

TIME: 1.5 HOURS   FULL MARKS: 25

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.
6. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q1 (a) "The p.u. impedance of the transformer is same whether referred to primary or secondary side of the transformer which is not the case when considering absolute values of these impedances." Justify.   [2]

    (b) Three generators are rated as follows: Generator 1: 100 MVA,33 kV, reactance 10%, Generator 2: 150 MVA,33kV, reactance 8%, Generator 3: 110 MVA,30kV, reactance 12%. Determine the reactance of the generator corresponding to base values of 200 MVA,35 kV.   [3]

Q2 (a) What will be the impedance of transmission line in p.u. on base voltage of 66 kV, if transmission line impedance X_L = 40 ohms/phase is measured on base voltage 220 kV. Consider base MVA=100.   [2]

    (b) Obtain the per unit representation for the three phase power system shown in figure. Choose base MVA = 100 and base voltage as 66 kV on transmission line.   [3]
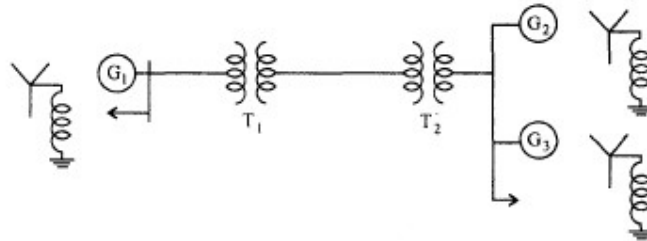
Generator 1 : 50 MVA,   10.5 KV;   X = 1.8 ohm
Generator 2 : 25 MVA,   6.6 KV;   X = 1.2 ohm
Generator 3 : 35 MVA,   6.6 KV;   X = 0.6 ohm
Transformer T_1 : 30 MVA,   11/66 KV,   X = 15 ohm/phase
Transformer T_2 : 25 MVA,   66/6.2 KV, as h.v. side X = 12 ohms
Transmission line : X_L = 20 ohm/phase

Q3 (a) What are the different types of buses considered in load flow analysis? Mention the known and unknown quantities associated with the each of the buses.   [2]

    (b) Develop the load flow equations for a 2-bus system connected with admittance Y.   [3]

Q4 (a) Find bus admittance matrix   [2]

Bus Code	Line impedance (p.u)	Charging admittance (p.u)
1 – 2	0.2 + j0.8	j0.02
2 – 3	0.3 + j0.9	j0.03
3 – 4	0.2 + j0.8	j0.02
1 – 3	0.1 + j0.4	j0.01

(b) Mention the steps of G-S solution for load flow problem with all necessary equations. [3]

Q5 (a) What is the condition for doubling effect under short circuit conditions [2]

(b) Explain the effect of short circuit on synchronous machine under no load conditions with equivalent circuits? [3]

Q6 (a) Draw the waveform of short circuit current of alternator on no load and explain the figure ? [2]

(b) What is the reason for time varying reactances of alternator under short circuit conditions? [3]

::::: 28/02/2020M ::::::