DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Semester Winter Examination – Dec. - 2019

Branch: ELECTRICAL **Sem.:- V**
Subject:- Power System-II (BTEEC502) **Marks:60**
Date:- 11/12/2019 **Time:- 3 Hr.**

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Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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Section-I

Q.1. SOLVE **(12)**

A) What is mean by economic load dispatch for a power plant having N generator units, derive the equal Incremental cost rule.

B) The costs of two units at the busses connected through a transmission line are (with P1and P2 in MW):

IC1=15+0.125 P1; **IC2=20+0.05 P2**

If 125 MW is transmitted from unit-1 to the load at bus-2, at which the unit-2 is present, a line loss of **15.625** MW is incurred. Find the required generation for each of the units and the power received by the load when the system lambda is Rs **24.0** per MWHr.

Q.2. SOLVE ANY TWO **(12)**

A) Solve Gauss seidal method as shown Fig 2.A

- **Using the Gauss-Seidel method, determine the phasor values of the voltage at the load buses 2 and 3, accurate to 2 decimal places**

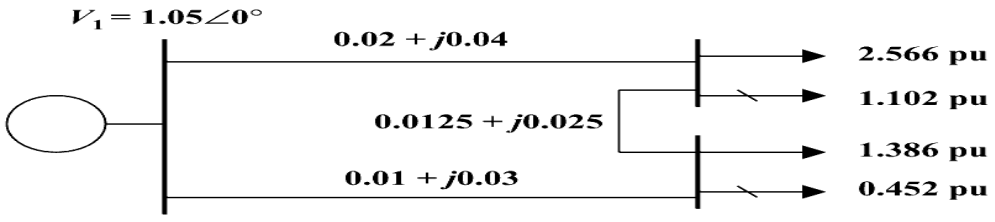

Fig. 2.A

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B) Discuss and derive newton raphson method for load flow solution.

C) Explain the various types of buses and their significance in detail.

Q.3. SOLVE. (12)

A) What are FACT devices? Enlist different FACT devices. Explain any two with their construction, operation, merits and demerits

B) Discuss excitation control and explain different types of excitation system for alternator.

Q.4. SOLVE ANY TWO (12)

A) Draw a diagram showing interconnection of sequence network for single line to ground fault. Derive equation for sequence currents.

B) An 11 KV, 25 MVA synchronous generators has positive negative and zero sequence reactances of j0.12, j0.12,and j0.08 p.u respectively. A single line to ground fault occurs at the generators terminals. Estimate a) fault currents b) line to line voltages Assume that the generator was unloaded before fault.

C) Derive an expression for symmetrical components in terms of phase voltages.

Q.5. SOLVE. (12)

A) Define a stability of power system? Derive expression for swing equation.

B) A generator with constant excitation supplies 30 MW through a step-up transformer and a high voltage line to an infinite bus bar if steady state stability is 60 MW, estimate the maximum permissible sudden increase of generator output (resulting from a sudden increase in prime mover input).if the stability is to be maintained. The resistances of the generator transformer and line may be neglected.

Q.6. SOLVE. (12)

A) Explain Load dispatch center functions in power system.

B) Explain power quality definition, problems, causes, effects.

Paper End

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