

BE/Insem/Oct-558
B.E. (Electrical) (Semester - I)
Power System Operation and Control
(2015 Pattern)

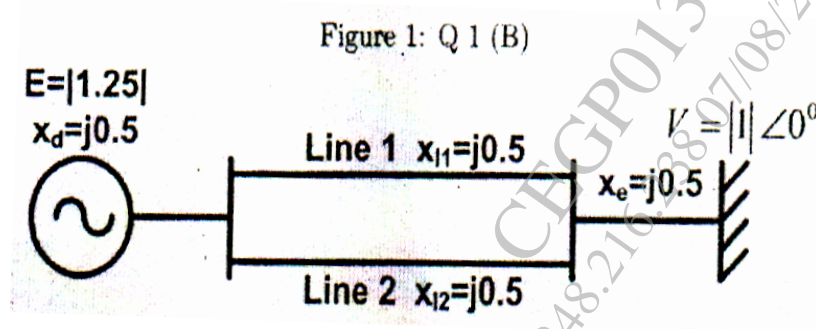
Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of scientific calculator is allowed.
- 5) Assume suitable data if necessary.

- Q1)** a) Define following terms [4]
- i) Steady state stability
 - ii) Transient stability
- b) For given circuit below, the fault is taken place at middle of the transmission line 2. After fault clearance line 2 is opened. Determine power transfer equation [6]
- i) Before fault
 - ii) During Fault
 - iii) Post fault. Also draw $P - \delta$ curve for all cases together. Assume that all quantities are in pu.



OR

P.T.O.

- Q2) a)** A synchronous generator feeds 1.0 pu power to an infinite bus via a transmission system (double circuit line). A fault occurs on one line which reduces the maximum power transfer to 0.5 pu, whereas before the fault this power was 2.0 pu and after clearance of the fault 1.5pu. By the use of equal area criteria determine the critical clearing angle. The losses in the system may be neglected. [6]
- b) Write down power transfer equation? Enlist methods to improve steady state stability limit and justify any one method. [4]

- Q3) a)** Elaborate effect of excitation on terminal voltage of synchronous generator. [5]
- b) Differentiate between shunt capacitor and synchronous condenser. [5]

OR

- Q4) a)** Draw synchronous generator capability curve. Elaborate each limit on this capability curve. [5]
- b) Suggest type of compensation required with justification in following situation [5]
- i) increase in power transfer capability
 - ii) reduce Ferranti effect

- Q5) a)** What are the basic types of FACTS controller? Elaborate all in details with diagram. [5]
- b) With schematic diagram, explain working principle of UPFC. [5]

OR

- Q6) a)** What are the different configurations of SVC? With neat diagram and VI characteristic elaborate any two configurations of SVC [5]
- b) With schematic diagram and VI characteristic, explain working of STATCOM. Give any two technical advantages of it. [5]

