

Total No. of Questions : 4]

SEAT No. :

P5213

[Total No. of Pages : 2

[6188]166

B.E. (Electrical Engineering) (Insem)
POWER SYSTEM OPERATION & CONTROL
(2019 Pattern) (Semester - VII) (403141)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

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

Q1) a) Obtain swing equation of synchronous machine. Draw a plot of power angle verses time for stable as well as unstable system. [7]

b) A loss-free generator supplies 50 MW to an infinite bus, the steady state limit of the system is 100 MW. If the prime mover input is abruptly increased by 30 MW. [8]

i) Determine whether the generator will remain in synchronism.

ii) Calculate Initial load angle (δ_0)

iii) load angle (δ_1)

iv) Maximum load angle (δ_m)

Write down formula for each case.

OR

Q2) a) List out the methods of improving stability of power system. And explain any three methods in detail. [7]

b) Derive an expression for the critical clearing angle for a power system consisting of single machine supplying to infinite bus through a double circuit line. Assume three phase line to ground fault occur at middle of line 2.

[8]

P.T.O.

- Q3)** a) Explain the principle of working of static synchronous compensator (STATCOM) with neat diagram. What are its advantages. [7]
- b) Write a short notes on any TWO: [8]
- Shunt compensation in power system.
 - Series compensation in power system.
 - Problem associated with series compensation.

OR

- Q4)** a) Explain in short reactive power generation by synchronous machine. Explain loading capability of synchronous generator with neat diagram. [7]
- b) Explain the principle of operation of Fixed capacitor thyristor controlled reactor (FC-TCR) with neat diagram. Draw its VI characteristics. [8]

