

02

EE: sem - VIII CBSAS FACTS  
Electricity

7/12/1

Q.P. Code: 27060

Time: 3 Hours

MAX. MARKS: 80

Note:

- 1) Question no 1 is compulsory.
- 2) Attempt any THREE from the remaining questions.
- 3) Assume suitable data wherever necessary and mention the same.
- 4) Figures to right indicate full marks.

Q.1) Attempt any four

20 Marks

- A) Explain the objectives of load compensations
- B) What limits loading capability of transmission systems?
- C) Write a short note on objectives of voltage and phase angle regulators.
- D) Explain the properties of ideal compensator.
- E) Write a short note on objectives of series and shunt compensators.

Q.2) A) Prove that the purely reactive compensator cannot maintain both constant voltage profile and unity power factor at the same time.

20 Marks

B) Explain power flow through mesh transmission lines.

Q.3) A) Show that for symmetrical line the mid-point voltage is higher than terminal voltage if it is loaded less than natural load i.e.  $P < P_0$ .

20 Marks

B) Explain the voltage / current characteristics of TCR and TCR with shunt capacitor.

Q.4) A) Show that voltage sensitivity for load reactive power is

20 Marks

$$dV/dQ_L = \frac{-E/S_{sc}}{1+K_r * E/S_{sc}}$$

B) Explain basic operating principle of switching converter based type VAR generators.

Q.5) A) Explain principle of operation of TSSC used as variable impedance type series compensator. 20 Marks

B) Explain with circuit diagram and waveform of SSSC used as switching converter type series compensator.

Q.6) A) Explain power flow control by using Phase angle regulator (PAR).

20 Marks

B) Explain with phasor diagram, functioning of UPFC as voltage regulator, line impedance compensator, phase shifter and simultaneous control of voltage, impedance and phase angle.