B.E. (Elect.) (sem. VIII) (Rev.).   19/12/07

Elective - II - FACTS

Con/5047-07.   (REVISED COURSE)   CD-6513

(3 Hours)   [Total Marks : 100

N.B. : (1) Question No. 1 is **compulsory**.
　　　(2) Attempt any **four** questions out of remaining questions.
　　　(3) **Figures** to the **right** indicate **full** marks.

1.　(a)　Classify different types of FACTS controllers. Explain any one in detail.　10
　　(b)　Explain the principle of TCR compensator and how compensator characteristics　10
　　　　is obtained using TCR.

2.　(a)　What is 'load compensation'. Describe the objectives of load copensation in　10
　　　　detail.
　　(b)　Explain in detail the phase balancing and power factor correction of　10
　　　　unsymmetrical loads.

3.　(a)　Explain the voltage and current profile for :　10
　　　　　(i)　The uncompensated line on open–circuit.
　　　　　(ii)　The symmetrical line at No-load.
　　(b)　Explain the different types of transmission line compensation in detail.　10
　　　　(i.e. virtual-20, virtual-Q, compensation by sectioning.)

4.　(a)　Explain the midpoint shunt reactor or capacitor compensation in detail with　10
　　　　their voltage profile.
　　(b)　Explain the effect of series compensator on power angle curve. Draw the　10
　　　　P–S diagram for various degree of compensation.

5.　(a)　Prove that the surge Impendance loading of the line has flat voltage profile.　10
　　(b)　Explain shunt compensation by synchronous voltage source.　10

6.　(a)　Using phasor diagram to illustrate different operation of UPFC.　10
　　(b)　Write short note on Tap changing transformer and booster transformer as a　10
　　　　compensator.

7.　(a)　Explain how seal and reactive power are obtained using inverter/converter.　10
　　(b)　A 132 KV generation at both ends of the line supplies power to the load of　10
　　　　75 MW at bus 2. The surge impedance of the line is 400 Ω. The line is
　　　　300 km long. Calculate reactive power loading of the transmission line. Hence
　　　　calculate the mid point voltage.

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