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Total Number of Pages : 02

B.Tech
PEL6J005

6th Semester Regular / Back Examination 2018-19
FLEXIBLE AC TRANSMISSION SYSTEMS

BRANCH : EEE

Max Marks : 100

Time : 3 Hours

Q.CODE : F626

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 Only Short Answer Type Questions (Answer All-10) (2 x 10)

- What do you mean by FACTS? Briefly explain.
- The thermal stability limits of loading capability of transmission lines are much higher than its other stability limits. Is it true?
- What are the objectives of series compensation?
- Briefly, differentiate SSSC and TCSC..
- What is a quadrature booster transformer (QBT)?
- State the various types of shunt FACTS controllers.
- What is sub-synchronous resonance?
- What is the importance of storage in case of converter-based FACTS devices?
- State the similarity between a Synchronous Generator and STATCOM.
- What is IPFC?

Part- II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- Giving an example, explain how better control over power flow is possible using FACTS controllers in parallel transmission lines.
- Explain various Limits of loading capability of transmission lines.
- Classify various types of FACTS controllers giving examples in each case.
- Explain midpoint voltage regulation for line segmentation.
- What is a SVC? Draw and explain the various configurations of SVC. .
- Explain with the help of a suitable model how transmittable power can be increase with series compensation.
- Explain thyristor switched capacitor (TSC). State the reasons, why capacitors are not thyristor controlled like a reactor or TCR?
- Draw the control scheme of STATCOM and explain.
- Establish the similarities between GCSC and TCR, and show that these devices are dual of each other.
- Compare SSSC with TCSC.
- Draw a schematic diagram of UPFC and explain its working.
- Explain the basic operating principles using a block diagram of an IPFC.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 What is midpoint shunt compensation? Derive and explain elaborately, how it enhances the steady state stability, transient stability and power oscillation damping of a power system. **(16)**

Q4 Explain with the help of a suitable model how transmittable power can be increase with series compensation. Describe the principle of operation of a TCSC, clearly indicating the different modes of operation. **(16)**

Q5 How can the power flow control be carried out using phase angle regulators? Explain how voltage and phase angle regulators are used to reduce loop power flow. **(16)**

Q6 Deduce that a UPFC can perform all functions of the traditional compensating devices used in a power system. **(16)**