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Total Number of Pages : 02

Course: B.Tech

Sub_Code: PEE6D002 / PEL6J005

6th Semester Back Examination: 2022-23
SUBJECT: Flexible Ac Transmission Systems
BRANCH(S): ELECTRICAL, EEE

Time : 3 Hour

Max Marks : 100

Q.Code : M188

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 Answer the following questions: (2 x 10)

- Give a comparison between STATCOM and SVC.
- What are the classifications of different frequency ranges of control action in FACTS Controllers?
- Draw the impedance Vs Delay angle characteristics of TCSC.
- Explain the role of DC link in UPFC.
- What is TCPST?
- What are the effects of injecting voltage in series with a transmission line?
- State the various stability limits of the loading capability of transmission lines.
- Briefly, differentiate between a TCR and TSR.
- What is Bang Bang control?
- What are the objectives of shunt compensation?

Part-II

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

- Explain the principle of operation of the Interline Power Flow Controller (IPFC) with a neat sketch.
- Why voltage sourced converters preferred over current-sourced converters for FACTS application?
- Explain in detail the phenomenon of sub-synchronous resonance (SSR) with an example.
- Explain. How TCBR is used for power oscillation damping.
- Explain how VSC will act as an inverter or a rectifier in inductive or capacitive mode.
- Give the schematic diagram of UPQC and explain each component of it.
- Explain the role of SVS in power system.
- Explain the working principle & V – I char. Of STATCOM.
- What is the importance of storage in the case of converter-based FACTS devices?
- Explain with a neat diagram, how voltage stability at the load bus can be achieved using series compensation.

- k) What is a synchronous condenser? What for it is used?
l) Briefly explain the basic UPFC control scheme with a suitable block diagram.

Part-III

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

- Q3** Draw the V-I characteristics showing the operating region for FC-TCR, TSR-TSC. **(16)**
- Q4** With a neat sketch, explain the operation of GCSC. **(16)**
- Q5** With a suitable phasor diagram explain how real and reactive power flow control is done using phase angle regulator. **(16)**
- Q6** What do you mean by variable impedance type Static Var Generator? Explain the operation of Thyristor Switched Capacitor (TSC). **(16)**