Sub Code: MPST-352 **ROLL NO.**

Model Question Paper

COURSE: M.TECH. **BRANCH**: POWER SYSTEM

SEMESTER: 3 **SUBJECT**: FACTS AND CUSTOM POWER DEVICES

Duration: 3:00 hrs **Max marks: 100**

Note: Attempt all questions.

1. **Attempt any four parts of the following.** **5x4 =20**

   A. What are the objectives of FACTS Technology? How these objectives can be achieved?

   B. Discuss the need of reactive power flow control in power system and methods to control it.

   C. Differentiate between DSTATCOM and STATCOM.

   D. What is the different power quality issues related to distribution systems?

   E. Explain principle operation and control of TSC and its applications.

2. **Attempt any four parts of the following.** **5x4=20**

   A. Explain DSTATCOM with characteristics a neat sketch.

   B. Mention loads that create harmonics. Explain ways to mitigate harmonics.

   C. Explain passive filters and active filters and their control.

   D. Discuss in detail about Reactive Power Compensation (RPC) theory for transmission system.

   E. Enlist various advantages of FACTS Technology.

3. **Attempt any two parts of the following.** **10x2=20**

   A. Discuss working principle, operation, control schemes and characteristic of an STATCOM.

   B. Explain about characteristics of voltage sag and voltage swell in detail.

   C. Write a detailed note on a Interline Power Flow Controller. Also discuss any one application of it.

4. **Attempt any two parts of the following.** **10x2=20**

   A. Explain in detail about Write the IEEE standards on power quality. Explain various power quality issues like voltage flicker and voltage imbalance and how to mitigate these.

   B. With the help of block diagram explain functional control structure of UPFC to control real and reactive power independently.

C. What are the advantages of static var compensators? Discuss the operation of Statics series Compensators.

5. Attempt any two parts of the following. 10x2=20

A. Discuss working principle, operation, control schemes and characteristic of TCR.

B. Describe the basic theory of series capacitor compensation line. Derive the transmitted power versus transmission angle formula for SSSC. Obtain the V-I Characteristics of SSSC.

C. List the different compensative types of custom power devices and also explain in detail about the load compensation using any one of the custom power device.