

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019**

**Course Code: EE464**

**Course Name: Flexible AC Transmission Systems**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks.*

Marks

- |   |  |     |
|---|--|-----|
| 1 | What is FACTS? Name different FACTS devices.   | (5) |
| 2 | How reactive power compensation can be achieved in a radial line? Explain with the help of voltage profile plots.  | (5) |
| 3 | What are the methods for controllable static VAR generation?   | (5) |
| 4 | What is the basic concept of voltage and phase angle regulator? How they differ in function?   | (5) |
| 5 | What is the basic principle of operation of STATCOM?   | (5) |
| 6 | Draw the functional schematics and phasor diagram of SSSC and Series capacitor compensation. What is the advantage of SSSC over Series capacitor compensation? | (5) |
| 7 | What are the power transmission parameters that can be controlled using UPFC?  | (5) |
| 8 | Explain the working principle of a IPFC with schematic of basic two-converter Interline Power Flow Controller scheme.  | (5) |

**PART B**

*Answer any two full questions, each carries 10 marks.*

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|----|---|------|
| 9  | How series capacitor can be used for power flow control through a transmission line? Derive the power transfer equation and explain the influence with power angle curve. | (10) |
| 10 | Compare between Static converter based and Passive Impedance based var generators   | (10) |
| 11 | Transient stability limit can be is increased for enhanced power transmission by shunt compensation. How?   | (10) |

**PART C**

*Answer any two full questions, each carries 10 marks.*

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|----|---|------|
| 12 | With schematic explain the following variable impedance type VAR Generators and draw their VI characteristics -TCR , TSC and FC-TCR | (10) |
|----|---|------|

- 13 a) Draw the schematic of a 3 phase PAR with thyristor tap changers having ternary proportioned winding sections for discrete level voltage control and Explain the working (7)
- b) Also draw the phasor diagram of the 3 phase PAR (3)
- 14 a) How a TCSC can be implemented? Explain with Schematics. (4)
- b) Draw the V-I operating region of TCSC in voltage and reactance control modes (6)

**PART D**

*Answer any two full questions, each carries 10 marks.*

- 15 a) Explain the direct control of SSSC with neat Schematic (10)
- 16 a) Draw the schematic of implementation of a UPFC. (4)
- b) What are the functions of series converter, shunt converter and DC link in the UPFC? (6)
- 17 Compare STATCOM and SVC (10)

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