

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech. Summer 2018-19 Examination**

**Semester: 6**  
**Subject Code: 03106380**  
**Subject Name: Power Electronics Application in Power System**

**Date: 09/05/2019**  
**Time: 10:30 am to 01:00pm**  
**Total Marks: 60**

---

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Objective Type Questions (Each of one mark)****(15)**

1. ....is used to control overvoltage at no load or light load.
  - a Series reactor
  - b Shunt reactor
  - c Series capacitor
  - d Shunt capacitor
2. During floating state, Maximum losses occur in .....
  - a TSC
  - b TSC-TCR
  - c MSC-TCR
  - d FC-TCR
3. In blocked thyristor operation mode, minimum losses occurs with  $X_{net} = \dots\dots\dots$ 
  - a 0.5
  - b 1
  - c 0
  - d None of these
4. In TCSC, thyristor valves are blocked in .....
  - a Bypass thyristor mode
  - b Block Thyristor Mode
  - c Inductive vernier mode
  - d Capacitive vernier mode
5. .... control both active power as well as reactive power
  - a TSC-TCR
  - b STATCOM
  - c UPFC Series capacitor
  - d Both B & C
6. In TCSC, if  $Q_{se}$  is 20% of  $Q_{sh}$  than  $\delta = \dots\dots\dots$
7. In TCSE controller, MOV is used for .....
8. In TCR if  $\alpha$  increase,  $B_{TCR}$  will .....
9. Range of firing angle in UPFC is .....
10. In TSC, inductor is connected in series with capacitor to .....
11. What is the importance of reactive power in power system?
12. Which order harmonics are called negative sequence harmonics?
13. Write equation of maximum power transfer in lossless transmission line.
14. How active power can be controlled in STATCOM?
15. What is UPFC?

**Q.2 Answer the following questions. (Attempt any three) (15)**

**A)** Explain 1-phase TCR.

**B)** Why 3<sup>rd</sup> harmonics are absent in line current if TCR during balance condition?

**C)** Explain importance of series and shunt compensation.

**D)** Explain principle of operation of STATCOM.

**Q.3 A)** Derive equation of maximum power transfer in lossless transmission line. (07)

**B)** Explain configuration and operating characteristics of FC-TCR. (08)

**OR**

**B)** Explain configuration and V-I characteristics of TSC-TCR. (08)

**Q.4 A)** Explain modes of operation of TCSC operation in detail. (07)

**OR**

**A)** Explain operating principle and characteristic of IPFC (07)

**B)** Explain V-I and X-I characteristics of single module TCSC. (08)