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Total Pages : 3

**451104**

**December, 2019**

**M.Tech. (Power Electronics and Drives) Ist Semester  
Static VAR Controller and Harmonic Filtering  
(MPS-112A)**

Time : 3 Hours]

[Max. Marks : 75

*Instruction :*

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*
4. *Assume any missing Data.*

**PART - A**

1. (a) SSSC is SSR neutral. Explain why? (1.5)
- (b) STATCOM is better than SVC in case of voltage collapse. Why? (1.5)
- (c) What are the sources of harmonics? (1.5)
- (d) List the limitations of passive filters. (1.5)
- (e) Enumerate the applications of DVR. (1.5)

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- (f) Why do we need multilevel inverters? (1.5)
- (g) What is bang-bang control of TCSC? (1.5)
- (h) How does TCSC damp power swings in a transmission line? (1.5)
- (i) What is load compensation? (1.5)
- (j) What are the causes of Flicker? (1.5)

### **PART - B**

- 2. (a) Explain the ill effects of harmonics in a power system. (5)
- (b) What is reactive power compensation? Explain the function of various compensating devices. (10)
- 3. (a) Explain the principle of operation and applications of STATCOM. (8)
- (b) Give the comparison between SVC and STATCOM. (7)
- 4. (a) Explain the principle of operation and applications of DVR. (5)
- (b) Discuss the various types of active filters with their applications. Discuss the control of shunt active filter using p-q theory. (10)

5. (a) Compare shunt and series active filters. (5)
- (b) Explain the control of series active filter in harmonic cancellation mode. (10)
6. (a) Discuss the SPWM control of multilevel inverter. (7.5)
- (b) What is function of flying capacitor? Explain the operation and features of flying capacitor type multilevel inverter? (7.5)
7. (a) Explain the operation and applications of UPQC. (5)
- (b) Explain SSR. Discuss different methods for damping SSR. (10)
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