

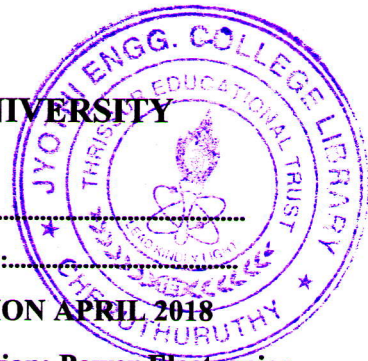
**APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY**  
**08 PALAKKAD CLUSTER**

08EE6242A-1-April18

(Pages: 3)

Name .....

Reg.No:.....



**SECOND SEMESTER M.TECH. DEGREE EXAMINATION APRIL 2018**

**Branch: Electrical & Electronics Engineering**

**Specialization: Power Electronics**

**08EE6242(A) : FACTS AND CUSTOM POWER DEVICES**

Time: 3 hours

Max.marks: 60

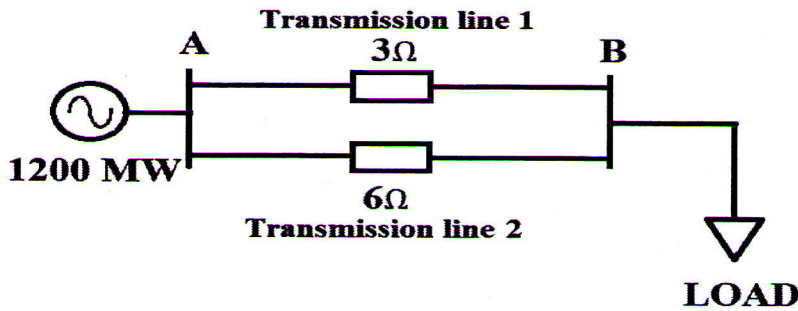
**Answer all six questions.**

**Modules 1 to 6:**Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q.no.	Module 1	Marks
1.a	Explain the concept of Programmed harmonic elimination technique	3

**Answer b or c**

- b A generator provides power to the load through two parallel connected transmission lines as shown in figure. The impedance of transmission line 1 and transmission line 2 are  $3 \Omega$  and  $6 \Omega$  respectively. The continuous rating of transmission line 1 and transmission line 2 are 700 MW and 600 MW respectively. If the generator supplies 1200 MW,



- (i) Find the power flow through each transmission line
- (ii) If any of the transmission line is overloaded, how is it possible to maintain the power flow using FACT controller? 6
- c (i) Explain the working of GTO inverters 6
- (ii) Explain the objectives of using FACTS Controllers.

<b>Q.no.</b>	<b>Module 2</b>	<b>Marks</b>
<b>2.a</b>	What are the advantages of using Multilevel inverter over conventional two level inverter?	<b>3</b>
<b>Answer b or c</b>		
<b>b</b>	With neat circuit diagram and waveforms, Describe the working of five level Diode clamped multilevel inverter under multi-carrier sine PWM control.	<b>6</b>
<b>c</b>	(i) Explain the working of Cascaded multilevel inverter	<b>3</b>
	(ii) Compare Diode clamped, Flying capacitor and Cascaded multilevel inverter topology.	<b>3</b>
<b>Q.no.</b>	<b>Module 3</b>	<b>Marks</b>
<b>3.a</b>	Compare the loss versus Var output characteristics of different static var generators	<b>3</b>
<b>Answer b or c</b>		
<b>b</b>	(i)Discuss the working of Thyristor controlled capacitor with neat circuit diagram and waveforms	<b>6</b>
	(ii)How transient free switching of thyristor switched capacitor is achieved? Explain.	
<b>c</b>	Discuss the basic internal converter control of STATCOM	<b>6</b>
<b>Q.no.</b>	<b>Module 4</b>	<b>Marks</b>
<b>4.a</b>	Briefly explain the objectives of using series compensation	<b>3</b>
<b>Answer b or c</b>		
<b>b</b>	Explain the concept and working of static synchronous series compensator (SSSC).	<b>6</b>
<b>c</b>	(i) Discuss the concept of improving transient stability using phase angle regulators.	<b>6</b>
	(ii)Briefly explain the working of Thyristor controlled voltage regulator (TCVR)	
<b>Q.no.</b>	<b>Module 5</b>	<b>Marks</b>
<b>5.a</b>	Discuss the operation of NGH- SSR Damping Scheme	<b>4</b>
<b>Answer b or c</b>		
<b>b</b>	Explain the Operating Principle of Unified power flow controller (UPFC).	<b>8</b>

c Describe the basic control structure of IPFC with block diagram. 8

<b>Q.no.</b>	<b>Module 6</b>	<b>Marks</b>
<b>6.a</b>	Describe various power quality issues related to distribution system.	<b>4</b>

**Answer b or c**

<b>b</b>	Explain the working and compensation of power quality issues using Dynamic voltage Restorer.	<b>8</b>
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<b>c</b>	(i) Discuss the operation of Unified Power quality Conditioner (UPQC) (ii) Explain the shunt and series compensator control in UPQC .	<b>8</b>
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