

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech S8 (Hons) Exam May 2020

**08EE6242A 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.	Marks
Module 1	
1.a What are the objectives of using FACTS Controllers?	(3)
Answer b or c	
b (i) Explain sine pulse width modulation (SPWM) in three phase Inverters?	(3)
(ii) A three phase inverter is working under Sine PWM control with amplitude modulation index (ma)=0.7 and frequency modulation index (mf)=20. The input DC voltage to the converter is 600V.If the frequency of carrier used in SPWM is 10kHz, find the RMS value and frequency of fundamental output voltage.	(3)
c Explain the working of GTO inverter.	(6)
Module 2	
2.a What are advantages of multilevel inverter?	(3)
Answer b or c	
b With neat circuit diagram and waveform, Explain the working of five level Diode Clamped Multilevel Inverter.	(6)
c Compare Diode Clamped, Flying capacitor and Cascaded Multilevel Inverters.	(6)
Module 3	
3.a What are the objectives of using shunt FACTS compensators in Power system?	(3)

Answer b or c

- b Explain the internal converter control of STATCOM. (6)
- c With neat diagram, Explain the transient free switching in Thyristor Switched Capacitor. (6)

Module 4

- 4.a What are the advantages of Static Synchronous Series Compensator (SSSC) over variable impedance type series compensators. (3)

Answer b or c

- b Explain the working of Thyristor controlled Series Capacitor (TCSC) (6)
- c (i) Compare Thyristor controlled Reactor (TCR) and GTO Thyristor Controlled Series Capacitor (GCSC). (3)
- (ii) Explain the working Thyristor Controlled Phase angle Regulator (TCPAR) (3)

Module 5

- 5.a What are the advantages of using Thyristor controlled Braking Resistor (TCBR)? (4)

Answer b or c

- b Explain the working of Interline Power Flow Controller (IPFC). (8)
- c Explain the control scheme of Unified Power Flow Controller (UPFC). (8)

Module 6

- 6.a Define Voltage Sag and Voltage Swell. (4)

Answer b or c

- b Explain the working and compensation of power quality issues using DSTATCOM. (8)
- c Explain the working of Unified Power Quality Conditioner (UPQC). (8)