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**R18**

Course Code: B30311



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

M.Tech II Semester Supplementary Examinations September-2023

Course Name: **SOLID STATE AC DRIVES**

(Power Electronics)

Date: 04.09.2023 FN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks.

5x4=20M

1. Brief the equivalent circuit of induction motor. State the effect slip on the rotor circuit of squirrel cage induction motor. 4M
2. Give the mechanism of dynamic braking in closed loop control of induction motor by PWM inverter. 4M
3. Describe the working of modified Kramer drive. 4M
4. List out the differences between the field-oriented control and direct torque control of induction motor. 4M
5. Illustrate when the synchronous motor said to be self-controlled. 4M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

6. A). Describe the operation of voltage control, frequency control and V/f speed control of induction motor. 10M

**OR**

6. B). A Y-Connected squirrel cage induction motor has following rating and the parameters: 400V, 50Hz, 4-Pole, 1370 rpm,  $R_s = 2\Omega$ ,  $R_r' = 3\Omega$ ,  $X_s = 3.5\Omega$  and  $X_r' = 2\Omega$  motor is controlled by voltage source inverter at V/f ratio. Inverter allows frequency variation from 10Hz to 50Hz. Calculate starting torque and current of this drive as a ratio of their values when the motor is started at rated voltage and frequency. 10M

7. A). Explain the concept of dynamic and regenerative braking of induction motor drive. 10M

**OR**

7. B). Describe in brief the closed loop control of VSI fed induction motor drive. Compare with control by CSI fed induction motor. 10M

8. A). Discuss the mechanism of static resistor rotor control of induction motor. 10M

**OR**

8. B). Explain the different slip power recovery schemes for induction motor control. 10M

9. A). Explain the concept of direct torque control of induction motor. 10M

**OR**

9. B). Explain the concept of FOC of induction motor. Why FOC of induction motor is analogy DC motor control? Explain. 10M

(P.T.O..)

10. A). i) Explain the margin angle control of synchronous motor.  
ii) Derive the torque expression of synchronous motor.

4M  
6M

**OR**

10. B). Discuss the starting and braking mechanisms of synchronous motor.

10M

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**R18**

Course Code: B30314



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

M.Tech II Semester Supplementary Examinations September-2023

Course Name: **FLEXIBLE AC TRANSMISSION SYSTEMS**

(Power Electronics)

Date: 08.09.2023 FN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks.

5x4=20M

1. What are the benefits of FACTS controllers? 4M
2. Differentiate Voltage source converter and current source converter. 4M
3. List the objectives of shunt compensation. 4M
4. Give the advantages of SVC. 4M
5. Differentiate between TSSC and TCSC. 4M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

6. A). What are the loading capability limitations? Explain how they can limit the loading capability? 10M
- OR
6. B). Explain the objective of FACTS controllers in the power system networks. 10M
7. A). Explain the operation of three-phase full wave bridge converter. 10M
- OR
7. B). Discuss the basic concept of three level voltage source converter with neat diagram. 10M
8. A). How shunt compensation will increase the transient stability? Explain. 10M
- OR
8. B). Discuss the terms in detail: i) Compensator Requirements ii) Power Oscillation Damping. 10M
9. A). What is the regulation slope? What are the reasons for regulation slope? Explain with V-I characteristics of the SVC and STATCOM. 10M
- OR
9. B). Briefly describe the way by which the transient stability is enhanced with static VAR compensator. 10M
10. A). Describe the capability of TCSC in improving transient stability, power oscillation damping and voltage stability applications. 10M
- OR
10. B). Explain, how series static compensation is used for improvement of transient stability? 10M

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**R18**

Course Code: B30316



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

M.Tech II Semester Supplementary Examinations September-2023

Course Name: **POWER QUALITY**

(Power Electronics)

Date: 11.09.2023 FN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks.

5x4=20M

1. Write the remedies to improve power quality. 4M
2. What is the importance of PF in power quality? 4M
3. Explain the importance of voltage regulation. 4M
4. Explain about necessity of generating reference currents when source is unbalanced. 4M
5. Explain why series compensation is required in power distribution system. 4M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

6. A). Explain characteristics of power quality events in short and long duration voltage variations. 10M
- OR**
6. B). Explain about power acceptability curves and power frequency variation. 10M
7. A). How do you classify three phase power system networks? Explain 10M
- OR**
7. B). Explain briefly about distorted source supplying nonlinear loads. 10M
8. A). Explain the principle of load compensation and voltage regulation 10M
- OR**
8. B). How Voltage Sag types are classified? Write the factors that affect the voltage sag types. 10M
9. A). Illustrate with example the control of DSTATCOM in voltage control mode. 10M
- OR**
9. B). Discuss in detail about instantaneous symmetrical components theory. 10M
10. A). Describe the necessity and operation of series voltage controller. 10M
- OR**
10. B). Explain working principle of unified power quality Conditioner (UPQC). 10M

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