MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)

M.Tech. II Semester End Examinations

Model Question Paper

Course Title: ADVANCED POWER ELECTRONIC CONVERTERS   **Course Code: EE201PC**

Time: 3 hours   Max. Marks   : 70

Answer any FIVE Questions

(Each question carries 14 marks)

Q. No.	Stem of the question	M	L	CO	PO
	Unit-I				
1. a)	Explain the difference between MOSFET, BJT and IGBT	7	1	1	1
b)	Explain the working of MOS Turn off Thyristor	7	2	1	1
	Unit-II				
2. a)	Explain in detail about Series Resonant Inverters with unidirectional switches	7	1	2	1
b)	The series resonant inverter has L1 = L2 = L = 50µH, C = 6µF, R= 2Ω, Vs = 220V, frequency of output voltage is of fo = 7KHz. Turn off time of thyristor is tq=10mS.Find i) the available circuit turn off time(toff), ii) Maximum permissible frequency (fmax) iii) Vpp (peak to peak capacitor voltage iv)The peak load current (Ip)	7	4	2	2
	Unit-III				
3. a)	Explain in detail about M type ZCS resonant converter with waveforms and circuit diagram	7	1	3	2
b)	The ZCS Resonant Converter delivers a maximum power of P_L = 400MW at V_o=4V.The supply voltage is V_s =12V. The maximum operating frequency is f_{max} =50kHz.Find the value of L and C. Assume that the intervals t_1 and t_3 are very small and x=1.5(I_m/I_o)	7	5	3	3
	Unit-IV				
4. a)	Explain the operation of ZVS resonant converter with neat diagram and output waveforms	10	4	4	4
b)	List out the applications of Multilevel inverters	4	1	4	1
	Unit-V				
5. a)	Explain the Principle of operation of Flying Capacitor multilevel inverter with neat diagram and output waveforms	10	1	5	6
b)	What is the need of Resonant converter	4	1	5	5
	a. Unit-I b. Unit-II				
6. a)	Explain Brief about DC side voltage control in rectifier	4	3	1	1
b)	Explain in detail about Parallel Resonant Inverter with neat diagram and output waveforms	10	4	2	3
	a. Unit-III b. Unit-IV				
7. a)	Explain in detail about L type ZCS resonant converter	4	3	1	3
b)	Discuss the principle, operation and features of 3-level diode clamped multilevel Inverter	10	1	2	4
	a. Unit-V b. Unit-I/II/III/IV/V				
8. a)	Explain in detail about Class E Resonant rectifier with neat diagram and output waveforms	7	1	2	5
b)	Give the advantages and disadvantages with comparing multilevel inverter, diode clamped multilevel inverter, Fining Capacitor multilevel inverter and Cascade H bridge multilevel inverter.	7	2	3	3

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Model Question Paper

Course Title: ELECTRICAL DRIVES   **Course Code: EE202PC**

Time   : 3 hours   Max. Marks : 70

Answer any FIVE Questions
(Each question carries 14 marks)

Q. No.	Stem of the question	M	L	CO	PO
	Unit-I				
1. a)	Derive the transfer function of a dc motor and load	5	3	1	2
b)	Briefly explain the design of current regulator and speed controller in the feedback system?	7	2	1	2
	Unit-II				
2. a)	Explain steady state analysis of chopper controlled DC motor drives by averaging	7	2	1	1
b)	What is the significance of closed loop operation and how it can be adapt to dc chopper fed drive	7	1	1	7
	Unit-III				
3. a)	Explain the open loop volts/Hz control of induction motors.	7	2	2	3
b)	What is slip power? How can it be recovered? Discuss the working of Static Scherbius Drive.	7	1	4	4
	Unit-IV				
4. a)	Explain the operation of induction motor when indirect method of vector control is adopted.	7	2	4	2
b)	Explain the principal of operation of Direct Torques control of induction motor drive?	7	2	4	3
	Unit-V				
7. a)	Analyze the operation of constant torque mode controller in synchronous motors.	7	4	7	2
b)	Explain the unity power factor control of synchronous motors.	7	2	7	3
	a. Unit-I b. Unit-II				
6. a)	Analyze the with neat block diagram different components of an electric drive.	7	4	1	3
b)	Compare stator side control and rotor side control of induction motors.	5	4	3	1
	a. Unit-III b. Unit-IV				
7. a)	Explain with a neat schematic diagram, the speed control of induction motor with torque and flux control.	7	2	3	1
b)	Explain Model referencing control adaptive control technique.	7	2	4	1
	a. Unit-V b. Unit-I/II/III/IV/V				
8. a)	Analyze in detail different speed control schemes for synchronous motor drives	7	4	7	4
b)	Elaborate the principal of operation of Direct Vector control of induction motor drive?	7	6	4	2

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MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)

M.Tech. II Semester End Examinations

Model Question Paper

Course Title: SCADA SYSTEMS AND APPLICATIONS   **Course Code: EE213PE**

Time: 3 hours   Max. Marks: 70

Answer any FIVE Questions
(Each question carries 14 marks)

Q. No.	Stem of the question	M	L	CO	PO
	Unit-I				
1. a)	Analyze Data acquisition system and its operation with block diagram	7	2	1	1
b)	Discuss the evolution of SCADA along with its features and benefits.	7	6	1	1
	Unit-II				
2. a)	Define RTU and IEDs.	4	3	2	1
b)	Illustrate the programmable logic controller along with block diagram and ladder diagram,	10	2	2	2
	Unit-III				
3. a)	Define IEC-61850 and its advantages and application.	7	1	2	2
b)	Explain Ethernet/IP protocol.	7	2	2	3
	Unit-IV				
4. a)	Compare various communication technologies used in SCADA systems	10	4	2	4
b)	Define Modbus RTU, RP-570.	4	1	2	1
	Unit-V				
5. a)	Explain automatic Substation Control through SCADA systems	10	2	3	6
b)	Interpret the case study of water treatment plant using SCADA system.	4	4	3	5
	a. Unit-I b. Unit-II				
6. a)	What are the components of SCADA? Explain briefly.	7	3	1	1
b)	Explain Energy Management Systems for large interconnected power system	7	2	3	3
	a. Unit-III b. Unit-IV				
7. a)	Demonstrate briefly the IOTs in SCADA systems.	4	3	1	3
b)	Explain 7 layers of OSI Model & their functions.	10	2	2	4
	a. Unit-V b. Unit-I/II/III/IV/V				
8. a)	Examine SCADA system used in Petroleum Refining Process.	7	2	3	5
b)	Classify different applications of SCADA system.	7	4	3	3

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M.Tech II Semester End Examinations

Model Question Paper

Course Title: Power Quality   **Course Code: EE217PE**

Time   : 3 hours   Max. Marks : 70

Answer any FIVE Questions

(Each question carries 14 marks)

Q. No.	Stem of the question	M	L	CO	PO
	Unit-I				
1. a)	Examine the occurrence of transients?	7	4	1	1
b)	How the power quality monitoring is performed in Distribution systems?	7	1	1	2
	Unit-II				
2. a)	Explain Evaluate the harmonic distortion in power system?	9	2	2	4
b)	How to calculate cost of interruptions?	5	2	2	3
	Unit-III				
3. a)	Explain sag magnitude calculation?	7	1	3	1
b)	How sag in calculated in meshed systems?	7	1	3	1
	Unit-IV				
4. a)	Explain the AC drive behavior under voltage sags?	7	2	4	1
b)	What are the mitigation methods for AC and DC drives?	7	4	4	1
	Unit-V				
5. a)	Analyze the mitigation methods for voltage sag compensation?	5	4	5	2
b)	How to improve equipment immunity?	9	2	5	5
	a. Unit-I b. Unit-II				
6. a)	Classify the power quality issues according to IEEE standard?	5	2	1	3
b)	Describe the reliability evolution model in power system reliability?	9	4	2	2
	a. Unit-III b. Unit-IV				
7. a)	Classify sags in three-phase system based on system configuration?	6	1	3	4
b)	Discuss the voltage sag equipment behavior for Computer & consumer electronics	8	6	4	4
	a. Unit-V b. Unit-I/II/III/IV/V				
8. a)	Examine about cascaded connected voltage controllers?	7	4	5	3
b)	What is voltage sag equipment behavior for Power electronic devices?	7	1	4	4

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