Hall Ticket Number :										

R-19

Code: 19B22FT

M.Tech. II Semester Regular & Supplementary Examinations November 2022

Power Quality

(Electrical Power Systems)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT–I

1. What is the impact of transient on power quality? Classify the transients that occur in power systems. 12M

OR

2. a) Explain about power quality and voltage quality. 6M

   b) Briefly explain the principle of Power Quality monitoring 6M

UNIT–II

3. a) Discuss the limits of interruption frequency. 6M

   b) Briefly explain the overview of Reliability evaluation to power quality. 6M

OR

4. a) What are the causes of long interruptions? 6M

   b) What are the limits of duration of long interruptions? 6M

UNIT–III

5. What are short interruptions and explain their causes. 12M

OR

6. a) Explain the voltage and current profiles during fault period and post fault periods. 6M

   b) Explain the differences between medium and low voltage systems. 6M

UNIT–IV

7. a) Explain various mitigation methods for DC drives. 6M

   b) Explain the effects of harmonics on power system equipment's and load. 6M

OR

8. Distinguish between harmonics and transients. Explain the different harmonic sources from various types of loads in detail. 12M

UNIT–V

9. a) Explain different methods about estimating the voltage sag performance. 6M

   b) Explain voltage sag characteristics such as magnitude, phase angle jump, point on wave initiation and point on wave recovery. 6M

OR

10. a) Discuss about combined shunt and series voltage controller. 6M

    b) Explain how mitigation equipment can be installed. 6M

END

Hall Ticket Number :										

R-19

Code: 19B222T

M.Tech. II Semester Regular & Supplementary Examinations November 2022

Power System Control & Stability

(Electrical Power Systems)

Max. Marks: 60 Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 12 = 60Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Illustrate the swing equation of a synchronous machine through rotor dynamics.	6M	CO1	L3
	b)	Classify and explain briefly the power system stability parameters.	6M	CO1	L2
		OR			
2.	a)	Discuss midterm and long term stability of a synchronous machine.	6M	CO1	L2
	b)	A synchronous machine is connected to an infinite bus through a transformer and a double circuit line. The infinite bus voltage is 1.0 pu, the direct axis transient reactance of the machine is 0.2 pu, the transformer reactance is 0.10 pu and the reactance of each of the transmission line is 0.40 pu. all to a base of the machine rating of the synchronous machine. Initially the machine is delivering a power of 0.8pu with a terminal voltage of 1.02 pu. The inertia constant is H=5MJ/MVA. All resistances are neglected. Find the swing equation.	6M	CO1	L3
		UNIT–II			
3.	a)	Develop the state space model of a machine connected to an infinite bus.	6M	CO2	L2
	b)	Explain the importance of voltage regulator with a time lag.	6M	CO2	L2
		OR			
4.	a)	Illustrate the dynamic stability of the system by Routh's Criterion.	6M	CO2	L3
	b)	Discuss the effect of armature reaction on unregulated synchronous machine.	6M	CO2	L2
		UNIT–III			
5.	a)	Explain the supplementary stabilizing signals.	6M	CO2	L2
	b)	Explain briefly about block diagram of the linear system.	6M	CO2	L2
		OR			
6.	a)	Describe the model of the complete exciter generator system.	6M	CO3	L2
	b)	Explain briefly about lead compensation on stability with neat diagram.	6M	CO3	L2
		UNIT–IV			
7.	a)	Explain the effect of excitation on generator power limits.	6M	CO3	L2
	b)	Explain Type-2 system in detail.	6M	CO3	L2
		OR			
8.		Illustrate the state space representation of Type-3 and Type-4 systems with the aid of block diagram.	12M	CO3	L3
		UNIT–V			
9.		Define voltage stability and voltage collapse? Describe the factors affecting voltage instability and collapse.	12M	CO3	L2
		OR			
10.	a)	Briefly explain about the importance of PV and QV curve in stability.	6M	CO3	L2
	b)	Write the methods of prevention of voltage collapse.	6M	CO3	L2

END

Hall Ticket Number :										

R-19

Code: 19B22AT

M.Tech. II Semester Regular & Supplementary Examinations November 2022

Smart Grid Technologies

(Electrical Power Systems)

Max. Marks: 60 Time: 3 Hours

Answer *any five* full questions by choosing one question from each unit (5x12 = 60 Marks)

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			Marks	CO	BL
		UNIT-I			
1.	a)	What improvisations are to be made in a conventional grid to make it a Smart Grid?	6M	CO1	L1
	b)	Explain the factors which contributed in the Evolution of Smart Grids.	6M	CO1	L2
		OR			
2.	a)	Mention few international policies in smart grids implementation.	6M	CO1	L1
	b)	Illustrate the need to implement Smart Grids?	6M	CO1	L2
		UNIT-II			
3.	a)	What is real-time pricing and how has it evolved.	6M	CO2	L1
	b)	Explain the Grid integration technologies w.r.t to Electric Vehicles?	6M	CO2	L2
		OR			
4.	a)	What Smart Sensors are utilized in Home and Building Automation?	6M	CO2	L1
	b)	Explain Substation Automation. List few of its benefits.	6M	CO2	L2
		UNIT-III			
5.	a)	How has Power system visualization improved using WAMS Technology?	6M	CO3	L3
	b)	Explain the role of Phasor Measurement Unit, and give its block schematic.	6M	CO3	L2
		OR			
6.	a)	Explain the role of communication technologies in successful implementation of WAMS?	6M	CO3	L1
	b)	Explain about the Super Conducting Magnetic energy storage system and its benefits.	6M	CO3	L2
		UNIT-IV			
7.	a)	Explain the working of micro turbines.	6M	CO4	L1
	b)	What is the difference between Captive power plants and Independent Power Plants?	6M	CO4	L2
		OR			
8.	a)	Illustrate the working of fuel-cells.	6M	CO4	L2
	b)	Illustrate the operation of Wind turbine generators.	6M	CO4	L2
		UNIT-V			
9.	a)	Mention any four power quality issues arising in power systems during renewable integration.	6M	CO4	L1
	b)	What are the various IP based protocols used in Advanced meter reading infrastructure?	6M	CO4	L2
		OR			
10.	a)	Define Power Quality and EMC in Smart Grids.	6M	CO4	L1
	b)	How can power quality monitoring be enhanced with web services?	6M	CO4	L2

END

Hall Ticket Number :										

R-19

Code: 19B221T

M.Tech. II Semester Regular & Supplementary Examinations November 2022

EHV AC Transmission

(Electrical Power Systems)

Max. Marks: 60 Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 12 = 60Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	What are the Effects of Resistance of Conductor?	6M	1,2	L1,L2
	b)	Derive the inductance of Two Conductor line.	6M	1,2	L2,L3
		OR			
2.	a)	A Drake conductor of North-American manufacture has an outer diameter of 1.108 inches having an Al cross-sectional area of 795,000 circular mils. The stranding is 26 Al/7 Fe. Its resistance is given as 0.0215 ohm/1000′ at 20°C under dc, and 0.1284 ohm/mile at 50°C and 50/60 Hz. Calculate diameter of each strand of Al and Fe in mils, inch, and metre units.	6M	1,2	L3,L4
	b)	List at least ten important problems encountered in EHV transmission which may or may not be important at voltages of 220k.v and lower.	6M	1,2	L2,L1
		UNIT–II			
3.	a)	Explain surface voltage gradient on conductors in a bundle.	6M	1	L2,L3
	b)	What are the effects of high electrostatic fields on biological organisms and human beings?	6M	1,3	L4,L5
		OR			
4.	a)	Evaluate the field of a point charge and its properties.	6M	2,3	L6
	b)	For a 400-kV line, calculate the maximum surface voltage gradients on the centre and outer phases in horizontal configuration at the maximum operating voltage of 420 kV, r.m.s. line-to-line. The other dimensions are H = 13 m, S = 11 m, N = 2, r = 0.0159 m, B = 0.45 m.	6M	2,3	L2,L3,L4
		UNIT–III			
5.	a)	Write a short note on a static VAR compensation.	6M	3	L1,L2
	b)	Discuss about charging current control.	6M	1,3	L2,L3
		OR			
6.	a)	Derive the Electrostatic induction on unenergized circuit of a double circuit line.	6M	2,3	L2,L4
	b)	Compare series and shunt compensation for EHV AC transmission.	6M	3	L3,L4
		UNIT–IV			
7.	a)	List the different corona loss formulae and explain each one.	6M	2,3	L3
	b)	Explain the generation and measurement of audio noise due to corona in EHV lines.	6M	2,3	L2,L3
		OR			
8.	a)	The field strength on the surface of a sphere of 1 cm radius is equal to the corona inception gradient in air of 30 KV/cm. Find the charge on the sphere.	6M	1,2,3	L3,L4,L5
	b)	Explain in detail the measurement of Audible Noise.	6M	1,3	L2,L1
		UNIT–V			
9.	a)	Discuss the steady-state limits.	6M	2,3	L1,L2
	b)	Briefly discuss the construction of cables.	6M	2,3	L2,L4
		OR			
10.	a)	Briefly discuss various design factors under steady state.	6M	1,3	L2,L3
	b)	Briefly discuss line insulation design based upon transient over voltages Air Gap clearance for power frequency and lightning.	6M	1,3	L2,L3

END