Enrollment No……

Master of Technology
First Semester Main Examination, Dec-2020
DSP and its Application [MTPS101]

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions out of eight. All questions carry equal marks.

Q.1 (a) What are linear time variant & invariant systems?
(b) Explain DFT& FFT.

Q.2 (a) Solve the Difference equation of a Casual Discreet-time LTI system which is expressed as under:
$y(n) + 3y(n-1) = x(n)$.
(b) Write the application of filters to analog signal processor and digital signal processor.

Q.3 (a) Write the application of DSP with explanation. Write Short note on spectrum analyzer.
(b) What is a Digital filter? Write the advantages and disadvantages of digital filter.

Q.4 (a) Explain the design of IIR filters from analog filters.
(b) Explain the design of linear phase FIR filter using window and frequency sampling method.

Q.5 (a) What do you understand by Radix of FFT algorithm find the number of commutations required for 2048 point DFT using normal method.
(b) Explain Sampling of signal in frequency domain.

Q.6 (a) Explain frequency analysis of discrete time signals.
(b) Write and explain any five properties of Fourier Transform.

Q.7 (a) Explain any three properties of Z-transform. How to describe the stability and causality of LTI system.
(b) Define antenna and explain its characteristic. Explain types of antenna used cellular mobile communication.

Q.8 (a) Explain Z-transform and Inverse Z-transform. Derive and prove linearity and shifting property of Z-transform
(b) Determine the DTFT of the signal: $x(n)=a^{n}\,|\,|;\ -1 < a < 1$

Enrollment No……

Master of Technology
First Semester Main Examination, Dec- 2020
Power System Dynamics Analysis and Control [MTPS102]

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions out of eight.
All questions carry equal marks.

Q.1 (a) Explain in brief voltage stability and voltage collapse and also factor affecting it.
(b) Explain briefly the Fundamental concept of stability of dynamic system.

Q.2 (a) Derive Voltage and Torque equation of synchronous machine.
(b)Write short notes on saturation model of synchronous machine.

Q.3 Define system security. Describe power system static security level.

Q.4 (a) Differentiate between Rotor angle stability and voltage stability.
(b) Explain the parks transformation.

Q.5 (a) Simplified representation of excitation control
(b) Differentiate steady state stability and transient stability analysis.

Q.6 (a) Explain equivalent circuits and phasor representation used in steady state analysis of synchronous machine.
(b) Describe the transient analysis of a synchronous machine.

Q.7 (a) Describe the modeling of the various components of the Excitation system.
(b) Explain the Various control and protective scheme of Excitation system.

Q.8 Write short notes on:
(a) Modeling of transmission line
(b) static load representation
(c) modeling of SVC.

Enrollment No……

Master of Technology
First Semester Main Examination, Dec-2020
Advance Power System Protection Relays [MTPS103]

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions out of eight. All questions carry equal marks.

Q.1 (a) Enlist the advantages and disadvantages of static relays. Explain the different types of amplitude and phase comparators with neat sketches.
(b) What is Protective relay? Explain its functional characteristics.

Q.2 (a) Explain sampling circuit and zero crossing detector.
(b) Explain the principle of operation of distance relays and discuss the effect of power swing and fault impedance on distance relay.

Q.3 (a) Explain the working principle of directional and non- directional type over current relays.
(b) Explain the construction, working principle and characteristics of reactance type distance relays.

Q.4 (a) Explain the construction, working principle and characteristics of percentage differential relay for internal and external fault.
(b) Draw the block diagram of Static relay and explain various functional blocks with individual circuits.

Q.5 (a) Explain the Duality between of amplitude and phase comparators.
(b) Explain the carrier system of protection. With the block diagram and neat sketches discuss how the phase comparison scheme can be used for protecting a transmission line.

Q.6 (a) What causes loss of Prime movers? Explain it.
(b) Explain earth fault protection. Explain Generator transformer unit protection

Q.7 (a) Explain high impedance bus differential scheme for bus bar protection.
(b) Describe with block diagram the principle of operation of microprocessor based percentage differential relay scheme for the operation of a power transformer.

Q.8 Write Short notes on
(a) Time delay cuts and level detectors
(b) Hall effect comparator
(c) Bus bar differential protection

Enrollment No.....

Master of Technology

First Semester Main Examination, Dec-2020

Power Electronics Applications to Power Systems (MTPS-104)

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions out of eight.

Q.1	**(a) What is meant by reactive power capability of an alternator? Explain capability curve.**	**7**
	(b) Explain the line loadabity of transmission line.	**7**
Q.2	**(a) Write the algorithm for formation of bus impedance matrix. Also mention the necessity for such matrix.**	**7**
	(b) Develop a mathematical model for phase shifting transformer.	**7**
Q.3	**(a) How will you generate elements of GSDF (Generation Shift Distribution Factor) for a bus system? Discuss its applications.**	**7**
	(b) Describe contingency. How it can be evaluated and what are the pre-contingency corrective scheduling?	**7**
Q.4	**(a) Describe proximity indicators for voltage stability.**	**7**
	(b) What is the significance of ranking in power system?	**7**
Q.5	**(a) Explain basic principles of FACTS in the transmission of power.**	**7**
	(b) Compare the performance of TSC and SVCs.	**7**
Q.6	**(a) Explain the effect of shunt compensation in power system with necessary derivation.**	**7**
	(b) Describe the reasons for variation of voltages in power system.	**7**
Q.7	**(a) Discuss the basic principle and basic modes of operation of TCSC.**	**7**
	(b) Explain in brief the analysis of transient stability model of TCSC.	**7**

Q.8 Write short note on :- (3.5 mark each)

(a) Surge Impedance Loading

(b) Power System Security Levels

(c) Line Outage Distribution Factors

(d) Reactive Power Control

Enrollment No.....

Master of Technology
First Semester Main Examination, Dec-2020
Advance Course in Electrical Machines (MTPS-105)

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions out of eight. All questions carry equal marks.

Q.1 **(a) Explain the basic reason of using transformation in electrical machines.**
(b) Give the steady state and transient analysis of DC machine and obtain the expression of speed in term of other parameter, draw its characteristics also.

Q.2 **(a) Describe the steady state operation using Krons primitive model and equivalent circuit of three phase induction motor.**
(b) Derive voltage and torque equation for steady state operation of single phase induction motor.

Q.3 **(a) Obtain the transformation equation for rotating three phase winding of synchronous machine.**
(b) Derive simplified equations of a synchronous machine with two damper coils.

Q.4 **(a) Explain the construction and working principle of scharge motor.**
(b) Explain how Park's transformation transforms in a, b, c variable to d, q, o variable?

Q.5 **(a) Draw the equivalent circuit for a polyphase induction motor and state what is represented by the various parameter involved in this circuit?**
(b) Derive voltage and power equation for salient alternator using diagram.

Q.6 **(a) Discuss the problems of power system analysis.**
(b) Explain line to line short circuit analysis of generator.

Q.7 **(a) A 3 – phase, 4 – pole, 50Hz induction motor develops an electrical torque of 7**
50 Nm at a slip of 0.10 under no load, the motor is running with slip of 0.01. If a load torque 30 Nm is suddenly applied to the motor shaft.
Find the
i) Speed as a function of time.
ii) Total inertia of motor and connected load is 6 kgm^2.
(b) Explain dynamic performance of three phase induction motor.

Q.8 **Write short note on :-** **(3.5 mark each)**
(a) Cross Field Commutator Machine.
(b) Scharge Motor.
(c) Application of approximate method to power system analysis.
(d) Polyphase Induction Motor.