Hall Ticket Number :										

R-19

Code: 19B22ET

M.Tech. II Semester Regular Examinations November 2020

AI Techniques in Power Systems

(*Electrical Power Systems*)

Max. Marks: 60 Time: 3 Hours

Answer *any five* questions from the following (5 x 12 = 60 Marks)

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1. a) Explain about McCulloch-Pitts Model. 6M

   b) Explain the classifications of ANN models. 6M

2. a) Explain characteristics of Artificial neural networks and write different applications of Artificial neural networks 6M

   b) What is meant by unsupervised learning explain it by Giving example learning laws. 6M

3. a) Explain the limitations of back propagation learning. Also explain the scope to overcome these limitations. 6M

   b) Describe the Medaline and Radial basis function networks. 6M

4. a) Explain the basic fuzzy set operations 6M

   b) Let X = { 1, 2, 3, . . . , 10}. Determine the cardinalities and relative cardinalities of the following fuzzy sets. 6M

   (i) $\tilde{A}$ = {(3,10, (4, 0.2), (5, 0.3), (6, 0.4), (7, 0.6), (8, 0.8), (10,1), (12, 0.8), (14,0.6)}.

   (ii) $\tilde{B}$ = {(2,0.4), (3, 0.6), (4, 0.8), (5, 1.0), (6, 0.8), (7, 0.6), (8, 0.4)}

   (iii) $\tilde{C}$ = {(2, 0.4), (4, 0.8), (5,1.0), (7,0.6)}

5. What are the main components of fuzzy logic controller? Explain each of them in detail. 12M

6. a) Write short notes on Fuzzification interface. 6M

   b) Explain centroid method of defuzzification method. 6M

7. Briefly discuss about Fuzzy logic application to power system stabilizer. 12M

8. a) Explain the basic steps for solving the problem with genetic algorithm with example. 6M

   b) Explain roulette wheel selection processes. 6M

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Hall Ticket Number :										

R-19

Code: 19B221T

M.Tech. II Semester Regular Examinations November 2020

EHV AC Transmission

(Electrical Power Systems)

Max. Marks: 60 Time: 3 Hours

Answer *any five* questions from the following (5 x 12 = 60 Marks)

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1.	a)	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
	b)	India is now “One Nation- One grid” .Explain briefly the role of EHVAC transmission in achieving this.	6M
2.	a)	Why the inductance and capacitance transformation is required in sequence quantities in EHVAC lines?	6M
	b)	Discuss the convenience offered by using modes of propagation and possible uses of this technique in EHVAC lines	6M
3.	a)	Derive the expression for maximum charge condition on a 3-phase line.	6M
	b)	What do you mean by gradient factor and what are its uses?	6M
4	a)	Explain the procedure of evaluation voltage gradients for a three phase double circuit line	6M
	b)	Explain the field of line charges and their properties	6M
5	a)	What do you mean by power frequency and give the reasons for occurrence of power frequency over voltages?	6M
	b)	Briefly explain about different static VAR compensation schemes	6M
6	a)	Discuss different corona loss formula used in EHV AC transmission lines	6M
	b)	State the different factors that affect the audible noise generated in EHV AC lines	6M
7.	a)	Briefly discuss various design factors under steady state	6M
	b)	Briefly discuss line insulation design based upon transient over voltages: Air Gap clearance for power frequency and lightning.	6M
8.	a)	Briefly discuss the construction of cables	6M
	b)	Briefly discuss various electrical characteristics of EHV cables	6M

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Hall Ticket Number :										

R-19

Code: 19B22BT

M.Tech. II Semester Regular Examinations November 2020

Economic Operation of Power Systems

(*Electrical Power Systems*)

Max. Marks: 60 Time: 3 Hours

Answer *any five* questions from the following (5 x 12 = 60 Marks)

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			Marks	CO	Blooms Level
1.	a)	Discuss the variations in steam unit characteristics with neat sketch.	5M	1	L1
	b)	Explain the solution of economic dispatch problem using Linear Programming method?	7M	1	L5
2.		Use the Lambda Iteration method to find the economic load dispatch for a total load of 450 MW assuming all three of the thermal units described below are running?			

Unit data (MBtu/Hr.)	Minimum (MW)	Maximum (MW)	Fuel cost (Rs./MBtu)
$H_1=225+8.4P_1+0.0025P_1^2$	45	350	0.80
$H_2=729+6.3P_2+0.0081P_2^2$	45	350	1.02
$H_3=400+7.5P_3+0.0025P_3^2$	47.5	450	0.90

			12M	1	L5
3.	a)	Explain the problem of unit commitment. Discuss the constraints in solving the unit commitment problem.	5M	2	L2
	b)	Discuss priority list method of unit commitment with an example.	7M	2	L3
4.	a)	Explain the short-term hydrothermal scheduling problem and derive co-ordinate equations?	7M	3	L3
	b)	Explain the hydroelectric power plant model with a neat sketch?	5M	3	L2
5.		A two plant system has a steam plant near the load centre and hydro plant at a remote location. The characteristics of both the stations are $C_1= (0.045P_T+26)P_T$ Rs./hr, $W_2= (0.004P_H+7)P_H$ m^3/sec and $\gamma_2=4x10^{-4}$ Rs./m^3 and $B_{22}= 0.0025$ MW^{-1}. Determine the power generation at each station and power received by the load when λ=65 Rs./MWh.	12M	3	L5
6.	a)	Draw the block diagram of load frequency control in two area control system and explain?	5M	4	L2
	b)	Obtain the transfer function and block diagram representation of first order turbine and generator models.	7M	4	L3
7.	a)	Discuss optimal reactive power dispatch formulation.	7M	5	L3
	b)	Describe the formal solution of the DC optimal power flow.	5M	5	L3
8.		Discuss the optimal power flow calculations combining economic dispatch and power flow.	12M	5	L5

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Hall Ticket Number :										

R-19

Code: 19B222T

M.Tech. II Semester Regular Examinations November 2020

Power System Control & Stability

(Electrical Power Systems)

Max. Marks: 60 Time: 3 Hours

Answer *any five* questions from the following (5 x 12 = 60 Marks)

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1. Develop the swing equation of a synchronous machine through rotor dynamics. 12M

2. A synchronous generator of reactance 1.30 pu is connected to an infinite bus bar through transformers and a line of total reactance of 0.75 pu. The no load voltage of the generator is 1.30 pu and the inertia constant is 5MW-sec/MVA. The resistance and machine damping may be assumed negligible. The system frequency is 50 Hz. Calculate the natural frequency of oscillations if the generator is loaded to i) 50% and ii) 85% of its maximum power limit. 12M

3. Develop the state space model of one machine system connected to infinite bus. 12M

4. Examine the dynamic stability of the system by Routh's Criterion. 12M

5. Draw the lead networks and explain lead compensation. 12M

6. Explain the response of continuously regulated excitation system with the aid of exciter block diagram. 12M

7. Develop the state space representation of Type-3 excitation system with the aid of block diagram. 12M

8. Explain the physical relation between voltage and reactive power flow. 12M

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