DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch : Electrical Engineering & Allied Branches Semester :VII

Subject Code & Name: BTEEC701 Power System Operation And Control

Max Marks: 60 **Date:13/08/2022** **Duration: 3.45 Hrs.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Explain Structure of Electrical Power System With neat Diagram.	(Understand)	6
B)	Explain in brief a) Active Power b) Reactive Power c) Complex power.	(Understand)	6
C)	What is Per Unit System? And Write all the advantages of PU System.	(Understand)	6
Q.2	**Solve Any Two of the following.**		**12**
A)	What is Natural or Surge Impedance Loading?	(Remember)	6
B)	Explain in detail power transfer and stability considerations in Electrical power System.	(Understand)	6
C)	Explain No load Tap changing transformer with neat diagram.	(Understand)	6
Q. 3	**Solve Any Two of the following.**		**12**
A)	Explain Schematic diagram And Physical description of Synchronous generator.	(Understand)	6
B)	What is dq0 transformation? And why we use the dq0 transformation.	(Understand)	6
C)	Write and explain basic equation of synchronous generator.	(Remember)	6
Q.4	**Solve the following.**		**12**
A)	Explain Speed governor system in detail.	(Understand)	6
B)	Why synchronous generators require excitation system? Write working of excitation system.	(Remember)	6
Q. 5	**Solve the following.**		**12**
A)	Derive the swing equation using classical model.	(Remember)	6
B)	Explain reactive power compensation and write basic type of reactive power compensation	(Remember)	6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Winter Examination - 2022

Course: B. Tech. **Branch : Electrical** **Semester : VII**

Subject Code & Name: BTEEC701 Power System Operation & Control

Max Marks: 60 **Date: 27-01-2023** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Define per unit valuc. Write any two advantages of per unit representation. A three-phase star-connected, 75MVA, 25kV synchronous generator has a synchronous reactance of 9 ohm per phase. Using rated MVA and voltage as base values, determine the per-unit reactance.	Application	**6**
B)	Write a short note on the On-load tap changing transformer and the regulating transformer.	**Understand**	**6**
C)	With the help of power triangle & equations describe the concept of real power, reactive power, and complex power.	**Understand**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Briefly explain the Park's transformation i.e. dq0 transformation.	Understand	**6**
B)	With neat diagrams explain the different types of excitation systems of an alternator.	**Understand**	**6**
C)	With a neat block diagram explain the load frequency control of the synchronous machine.	**Understand**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	Explain the modeling of the generator, load, and governor system in the case of a thermal power plant.	Understand	**6**
B)	With a neat diagram explain the equal area criteria for assessing transient stability.	Understand	**6**
C)	Derive the swing equation of the synchronous Machine.	Application	**6**

Q.4	**Solve Any Two of the following.**		12
A)	With a neat diagram describe the point-by-point method of solving the Swing equation.	Understand	6
B)	The fuel costs of two generators are given by, $C_1 = 1.6 + 15P_1 + 0.1P_1^2\ Rs/hr.$ $C_2 = 1.8 + 25P_2 + 0.1P_2^2\ Rs/hr.$ If the total demand for the generators is 250MW find the economic loading of two generators.	Application	6
C)	Derive the condition for economic load dispatch when transmission losses are neglected.	Application	6
Q. 5	**Solve Any Two of the following.**		12
A)	Derive the expression for transmission line losses in terms of power plant generation when two units are supplying the load. Also, write the equations of loss coefficients.	Application	6
B)	With a neat diagram explain the operation of a synchronous condenser.	Understand	6
C)	Explain the reactive power compensation by the capacitor and derive the expression for the reactive power supplied by the capacitor.	Application	6
	***** End *****		

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