Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**PDDC - SEMESTER– IV • EXAMINATION – SUMMER 2015**

**Subject Code:X40903** **Date:02/06/2015**

**Subject Name: Power System Analysis and Simulation**

**Time:10.30am-01.00pm** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | Derive expression of ABCD parameters for medium transmission line using nominal $\pi$ method | **07** |
| | **(b)** | What is per unit system? Discuss the advantages of P.U. Systems | **07** |
| **Q.2** | **(a)** | Classify the over head transmission lines also explain briefly Surge Impedence loading of transmission line | **07** |
| | **(b)** | What do you mean by armature reaction. explain Armature reaction in synchronous machine | **07** |
| | | **OR** | |
| | **(b)** | Define an autotransformer. also derive an expression for the saving in autotransformer as compared to an equivalent two winding transformer | **07** |
| **Q.3** | **(a)** | Draw the waveforms for fault current for a 3-phase fault on alternator terminals. Explain the sub-transient, transient and steady state reactance | **07** |
| | **(b)** | Write a note on zero sequence networks of transformers | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain bus impedance matrix method | **07** |
| | **(b)** | Introduce symmetrical components and state their applications. Derive symmetrical components of a given set of three unbalanced current phasors | **07** |
| **Q.4** | **(a)** | Using appropriate sequence networks, derive the equation for a line to line fault in a power system with a fault impedance of Zf | **07** |
| | **(b)** | Explain corona and discuss the factors affecting the corona loss | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Discuss the different types of faults on the transmission lines | **07** |
| | **(b)** | Explain critical disruptive voltage and radio interference due to corona | **07** |
| **Q.5** | **(a)** | Explain need of neutral grounding using phasor diagrams. Explain resonant grounding | **07** |
| | **(b)** | Write a short note on capacitance switching | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain the difference between resistance and reactance grounding. Explain earthing transformer | **07** |
| | **(b)** | Explain three phase sudden short circuit of synchronous machine | **07** |

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