

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: PG
BRANCH: MECH (MESRA)

SEMESTER: 2nd
SESSION: SP22

SUBJECT: EE597 POWER GENERATION, TRANSMISSION AND DISTRIBUTION
TIME: 2Hrs FULL MARKS:50

INSTRUCTIONS:

1. The question paper consists of 50 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data handbook/Graph paper etc., to be supplied to the candidates in the examination hall.
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- Q1 Explain the Ferranti effect with a phasor diagram and its causes. [3]
- Q2 Draw the sketch of a single-core low tension cable and label the various parts. [3]
- Q3 What are the different kinds of DC links? Draw relevant diagrams. [3]
- Q4 Compare EHVAC and HVDC transmission. [3]
- Q5 Define feeder, distributor, and service mains. [3]
- Q6 Obtain the ABCD parameters for a Short length Transmission line and discuss voltage regulation and draw the corresponding phasor diagram. [5]
- Q7 Explain the following systems of distribution: [5]
(i) Radial system (ii) Ring main system (iii) Interconnected system
- Q8 A single phase overhead transmission line delivers 4000 kW at 11 kV at 0.8 p.f. lagging. If resistance and reactance per conductor are 0.15 Ω and 0.02 Ω respectively, calculate: (i) percentage regulation (ii) sending end power factor (iii) line losses. [5]
- Q9 Discuss the importance of reactive power and explain different types of reactive power compensation techniques used in power system. [5]
- Q10 A single area consists of two generating units with the following characteristics: [5]
- | Unit | Rating | Speed regulation (R) |
|------|---------|----------------------|
| 1 | 600 MVA | 6% |
| 2 | 500 MVA | 4% |
- The units are operating in parallel to share a load of 900 MVA. Assuming free governor operation, determine the load shared by each unit. If the frequency is decreased by 0.05 Hz, determine the increase in turbine output of these two units for steady state output.
- Q11 Describe the governing operation of a power plant with neat diagram. [5]
- Q12 With neat schematic, explain the principle of HVDC system operation. [5]