

Roll No.....

Total No. of Printed Pages: 1

Total No. of Questions: [11]

M. Tech. EE (Semester- 2nd)
POWER SYSTEM OPERATION AND CONTROL
Subject Code: MELE1205
Paper ID: [190512]

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It carries 16 marks. It consists of 4 questions of 4 marks each.
2. Section B consist of 4 questions of 8 marks each. The student has to attempt any 3 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(4 marks each)

- Q1.** Give an overview of the features of pumped hydro storage as a kind of energy storage. How is the supply and demand of power balanced using pumped hydro?
- Q2.** Describe the coordination equations used to model transmission losses.
- Q3.** Make a distinction between hydro scheduling that is short-term and long-term.
- Q4.** Write the explanation of Automatic Voltage Control (AVC) in relation to power system operation.

Section – B

(8 marks each)

- Q5.** Describe the gradient method as an economic dispatch optimization methodology. In what way does the gradient method approach the best solution?
- Q6.** Explain the unit commitment problem-solving technique of dynamic programming. What advantages does dynamic programming offer in handling complex scheduling scenarios?
- Q7.** Define the concept of scheduling energy in the context of hydrothermal coordination. Also define the primary objectives in solving short-term scheduling problems.
- Q8.** Discuss a take-or-pay fuel supply contract in the context of power generation. How does this contractual arrangement impact the decision-making process in generation planning?

Section – C

(10 marks each)

- Q9.** Discuss the concepts of base point and participation factors in economic dispatch. Explain the procedure for economic dispatch without considering line losses.
- Q10.** Talk about the many techniques used to determine penalty factors. Give explanation of the B matrix loss formula used for estimating transmission losses.
- Q11.** Explain how Optimal Power Flow was formulated using the Newton approach. What are the benefits of optimising power systems with the Newton method?