

Code No: 156CK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, February - 2023

POWER SYSTEM OPERATION AND CONTROL

(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 75

- Note:** i) Question paper consists of Part A, Part B.  
 ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.  
 iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART - A**

(25 Marks)

- 1.a) What is the need for load flow studies? [2]
- b) Explain the merits of N-R (Newton-Raphson) method. [3]
- c) Define current distribution factor. [2]
- d) Explain (i) Incremental fuel rate curve (ii) Incremental cost curve. [3]
- e) What is Q-V control channel? [2]
- f) What are the basic requirements of a load frequency control? [3]
- g) What is voltage stability? [2]
- h) Explain the terms: (i) critical clearing angle (ii) critical clearing time. [3]
- i) What is power system monitoring? [2]
- j) Explain the concept of load dispatch centre. [3]

**PART - B**

(50 Marks)

2. For the system shown in figure below, with bus 3 as reference bus, the bus impedance matrix is given by Start with  $V_1^{(0)} = V_2^{(0)} = 1.05 \angle 0^\circ$ , and solve for  $V_1$  and  $V_2$  by the Gauss-Seidel method. [10]

$$Z_{bus} = \begin{bmatrix} 1.33 + j1.33 & 1 + j1 \\ 1 + j1 & 1.5 + j1.5 \end{bmatrix} \times 10^{-2} \text{ pu}$$



