

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S8 (R,S) Exam April 2025 (2019 Scheme)

**Course Code: EET464****Course Name: COMPUTER AIDED POWER SYSTEM ANALYSIS****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

Marks

- 1 The admittances between the various buses in a power system are given in the (3)

table

Buses	Admittances in pu
1-2	0.10
1-4	0.20
2-3	0.25
2-4	0.50
3-1	0.40
4-3	0.50

below. Obtain the  $Y_{bus}$  matrix.

- 2 Define oriented graph, rank and element of a graph with an example (3)
- 3 List out the methods used to find out the solution of linear equations (3)
- 4 Explain Tinney's optimal ordering scheme (3)
- 5 Discuss about the load flow analysis and any two solution techniques. (3)
- 6 Write a short note on buses in a power system and their classification. (3)
- 7 Discuss the difference between fuel cost and incremental fuel cost of generators in a power system? (3)
- 8 List out the merits and demerits of Newton's method of optimal power flow? (3)

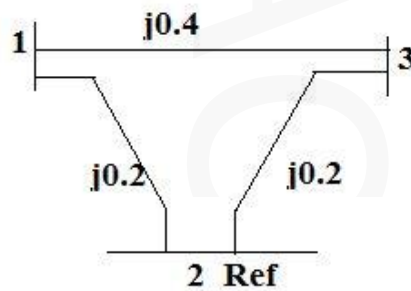
- 9 Develop the algorithm for short circuit calculations for electrical networks. (3)
- 10 What are faults in power system network and what are the assumptions considered while analysing faults? (3)

### PART B

*Answer any one full question from each module, each carries 14 marks.*

#### Module I

- 11 For the network shown in figure below, obtain the bus impedance matrix using bus building algorithm. (14)



### OR

- 12 Determine the  $Y_{bus}$  by singular transformation for the system with data as follows: (14)

Element No.	Bus data	Self admittance
1	0-1	1.2
2	1-2	1.6
3	2-3	2.2
4	2-0	1.8
5	3-0	2.4

#### Module II

- 13 Solve the following equation by Gauss Jordan method:  $x-2y = -4$ ;  $-5y+z = -9$ ; and  $4x-3z = -10$  (14)

### OR

- 14 Solve the following equations by LU decomposition method: (14)
- $x+y+z = 1$ ;  $4x+3y-z = 6$ ;  $3x+5y+3z = 4$

**Module III**

- 15 a) List out the assumptions and explain dc load flow analysis. (8)  
b) Compare Newton Raphson and fast decoupled load flow analysis? (6)

**OR**

- 16 a) Explain Newton Raphson method of load flow analysis (8)  
b) List out the merits and demerits of fast decoupled load flow studies (6)

**Module IV**

- 17 Discuss about the economic load dispatch of generators including transmission losses. (14)

**OR**

- 18 a) Explain the optimal power flow problem and solution using gradient's method (10)  
b) List out the merits and demerits of gradients's method of optimal power flow? (4)

**Module V**

- 19 Obtain the sequence network for a line to line fault through an impedance  $Z_f$  at the terminals of an unloaded generator. (14)

**OR**

- 20 a) What is the need of performing short circuit analysis in power system? (4)  
b) Explain the symmetrical fault calculation using bus impedance method? (10)

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