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Code No. : 21712

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.E. (EEE: CBCS) I-Semester Main Examinations, January-2018
 (Power Systems & Power Electronics)

Advanced Computer Methods in Power Systems

Time: 3 hours

Max. Marks: 60

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Q. No	Stem of the Question	M	L	CO	PO
Part-A (10 × 2 = 20 Marks)					
1.	Define the following terms i) Link ii) Basic loop	2	1	1,2	1
2.	Show that $A_b K^t = U$	2	2	1,2	1,2
3.	What do you mean by triangularization?	2	1	1,2	1,2
4.	Write expressions for Z_{qi} and Z_{qq} when added element is a branch. Assume P is reference node?	2	2	1,2	1,2
5.	What is the importance of load flow studies in power systems?	2	2	3	1,3
6.	What is acceleration factor? In which method of load flow this factor is recommended?	2	2	3	1,3
7.	Write the importance of Clark's transformation matrix?	2	2	1,2	1,2
8.	Write the equations for Z_{ii}^{abc} and Z_{ij}^{abc}	2	3	1,2	1,2
9.	What are the different types of faults and write the effect of each fault on the power system?	2	2	2	1,2
10.	Estimate the fault level when a fault takes place in power system?	2	3	1,2	1,2
Part-B (5 × 8 = 40 Marks)					
11. a)	The transpose of the matrix A is given by A^t $= \begin{bmatrix} -1 & 1 & 0 & 1 & 0 & 0 \\ 0 & -1 & 1 & 0 & 0 & 0 \\ 0 & 0 & -1 & -1 & 1 & 0 \\ 0 & 0 & 0 & -1 & 1 & 1 \end{bmatrix}$ Draw its oriented graph and obtain B, \bar{B} , C, \bar{C} and K matrices of the network?	6	4	1,2	1,2
b)	Write the equation for Zloop by singular transformation?	2	2	1,2	1,2
12. a)	Find Zbus for the system shown in fig.	4	5	2	1,2
b)	Explain the algorithm for formation of Zbus matrix	4	2	3	1,2

13. a)	With the help of flowchart, explain how to obtain load flow solution using Fast decoupled load flow method?	5	2	3	1,3,4
b)	Explain the classification of buses in load flow studies.	3	2	3	1,2
14. a)	Explain an algorithm for formation of three-phase bus impedance matrix for addition of branch?	5	4	3	1,3,4
b)	What are transformation matrices and write their significance.	3	2	2	1,2
15. a)	Derive the expressions for fault currents, voltages when 3-phase to ground fault occurs at bus P. Also write flowchart?	5	4	1,2	1,2
b)	What are the basic assumptions made in short circuit studies.	3	2	2	1,2
16. a)	For the network shown in fig., obtain the bus admittance matrix by singular transformation?	5	5	1,2	1,2
b)	What are the advantages of Zbus building algorithm?	3	2	1,2	1,3
17.	Answer any <i>two</i> of the following:				
a)	Compare the various methods of load flow study?	4	1	1,2	1,3
b)	Show that impedance matrix is same both in symmetrical components and Clark's components for a balanced three-phase stationary elements?	4	2	1,2	1,2
c)	Derive Z_F^{abc} for LLG fault on phases b and c?	4	3	1,2	1,2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	58.75
2	Knowledge on application and analysis (Level-3 & 4)	30.0
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	11.25
