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Code No. : 16348 O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. (E.E.E.) VI-Semester Backlog Examinations, May/June-2023

Power Systems-II

Time: 3 hours

Max. Marks: 60

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

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO																								
1.	What is the effect of load power factor on regulation of a transmission line?	2	1	1	1																								
2.	Define tuned lines.	2	1	1	1																								
3.	How are the base values are chosen in per unit representation of power system?	2	2	2	1																								
4.	Why do we go for iterative methods to solve load problems?	2	2	2	1																								
5.	Explain the significance of subtransient reactance in short circuit studies.	2	1	3	1																								
6.	Why Z bus is needed in fault analysis?	2	2	3	1																								
7.	What are symmetrical components?	2	1	4	1																								
8.	Compare Symmetrical and unsymmetrical faults.	2	2	4	1																								
9.	Mention any two causes of over voltages.	2	2	5	1																								
10.	What is bewley lattice diagram?	2	1	5	1																								
Part-B (5×8 = 40 Marks)																													
11. a)	Deduce an expression for voltage regulation of a short transmission line by giving the vector diagram.	4	2	1	1																								
b)	A single phase transmission line is transmitting 1100 KW power to a factory at 11 KV and at 0.8 PF lagging. It has a total resistance of 2 ohm and a loop reactance of 3 ohm. Determine i) voltag at the sending end ii) percentage regulation iii) transmission efficiency	4	3	1	1,2																								
12. a)	Obtain the voltages at all buses for the three-bus system shown in figure at the end of the first iteration by GS method.	5	3	2	1,2																								
Line data																													
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Contd... 2

b)	Compare Gauss seidel, Newton Raphson load flow methods.	3	4	2	1
13. a)	Explain the necessary steps to develop a Z bus.	3	1	3	1
b)	A 11 KV, 100 MVA alternator having a sub-transient reactance of 0.25 p.u is supplying a 50 MVA motor having a sub-transient reactance of 0.2 p.u through a transmission line. The line reactance is 0.05 p.u on a base of 100 MVA. The motor is drawing 40 MW at 0.8 p.f leading with a terminal voltage of 10.95 KV when a 3-phase fault occurs at the generator terminals. Calculate the total current in generator and motor under fault condition.	5	3	3	1,2
14. a)	A star connected resistive load is connected across a balanced three phase supply of 415V, R1= 20 Ohm, R2= 250 Ohm, R3= 15 Ohm. Calculate symmetrical components of line currents.	4	3	4	1,2
b)	Derive the equivalent circuit and necessary equations for an LG fault.	4	2	4	1
15. a)	Develop expression for reflection and refraction co-efficient for I & V when line is terminated with an inductor.	4	2	5	1
b)	Two stations are connected together by an underground cable having a surge impedance of 50 ohm joined to an overhead line with a surge impedance of 600 ohm. If a surge having a maximum value of 100 KV travels along the cable towards the junction with the overhead line, determine the value of the reflected and transmitted wave of voltage and current at the junction.	4	3	5	1,2
16. a)	Discuss critical disruptive, critical visual voltages, corona loss and write its formulas.	4	2	1	1
b)	<p>Draw the perunit diagram of the given network</p>	4	3	2	1,2
17.	Answer any <i>two</i> of the following:				
a)	Discuss short circuit capacity of a bus in a power system.	4	2	3	1
b)	Explain Power Invariance of three phase circuit using symmetrical components.	4	1	4	1
c)	Derive velocity of a travelling wave form	4	2	5	1

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

i)	Blooms Taxonomy Level – 1	21%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	39%

2009