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BTECH
(SEM VI) THEORY EXAMINATION 2024-25
POWER SYSTEM-II

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief. 02 x 7 = 14

Q no.	Question	CO	Level
a.	During three phase fault which sequence component should be calculated? Explain with the reason.	1	K4
b.	Explain the need of load flow analysis.	2	K2
c.	Enumerate different types of buses and their significance in power system.	2	K1
d.	A 100 kV surge travels on an overhead line with a surge impedance of 500 Ω, which is terminated by a cable with a surge impedance of 50 Ω. Calculate the magnitude of the reflected and transmitted voltage?	3	K3
e.	Enumerate five factors affecting the transient stability of power system.	4	K2
f.	Classify relays based on their application.	5	K1
g.	Differentiate between restriking and recovery voltage.	5	K2

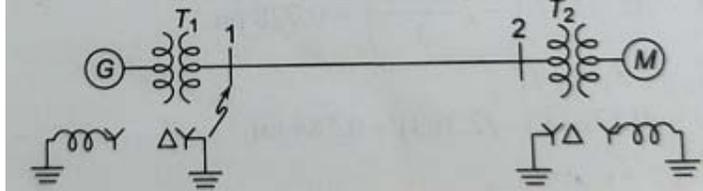
SECTION B

2. Attempt any three of the following: 07 x 3 = 21

a.	A synchronous generator feeds bus 1 of a system. A power network feeds bus 2 of the system. Buses 1 and 2 are connected through a transformer and a transmission line. Per unit reactances of the various components are: Generator (connected to bus bar 1): 0.25 Transformer: 0.12 Transmission Line 0.28 The power network can be represented by a generator with a reactance (unknown) in series. With the generator on no load and with 1.0 pu voltage at each bus under operating condition, a three-phase short circuit occurring on bus 1 causes a current of 5.0 pu to flow into the fault. Determine the equivalent reactance of the power network.	1	K4
b.	Explain Z_{BUS} building algorithms with all types of modification.	2	K2
c.	Explain Bewley's Lattice diagram. Prove the statement that an open circuited line behaves as a leading power factor network.	3	K2
d.	Derive power flow equations and prove that the reactive power flow in the transmission line is proportional to the difference between magnitudes of sending end and receiving end voltages.	4	K4
e.	Explain the working of overcurrent relay through neat diagram.	5	K2

SECTION C

3. Attempt any one part of the following: 07 x 1 = 07

a.	Derive the expression for fault current of double line to ground fault and draw the related sequence networks.	1	K2
b.	Design the positive, negative and zero sequence network of the system shown in mentioned figure when a single line to ground fault (on phase a) occurs on bus 1. Also calculate the fault current. 	1	K5

