

Enroll No

K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar
 (An Empowered Autonomous Institute, affiliated to SUK)
Unit Test -II (2025-26)

Q.P. Code
UT 3078

T.Y. B.Tech.-Electrical Engineering
Course Code: EE3034 Course Name: Power System Analysis

Day & Date: Thursday 18/09/2025
 Time: 10:30 To 11:30

Max Marks- 25

- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures in rounded () brackets within the question, indicate the scheme of marking for respective part of the question, whereas, figures in the first right column indicate total marks for that whole question.
 - 3) CO is the index number of the Course Outcome statement.
 - 4) The Bloom's taxonomy level (BL) for 1,2,3,4,5 and 6 is remember, understand, apply, analyze, evaluate and create respectively.
 - 5) Assume suitable data if necessary.
 - 6) Use of non-programmable calculators is allowed

Q.1 A A three phase transmission line operating at 33 kV and having a resistance and reactance of 5Ω and 20Ω respectively is connected to a generating station busbar through a 15 MVA step up transformer which has a reactance of 0.06 per unit. Connected to the busbars are two generators, one 10 MVA having 0.1 per unit reactance and another 5 MVA having 0.075 per unit reactance. Calculate the short circuit MVA and the fault current when a three phase short circuit occurs (a) at high voltage terminals of the transformer (b) at the load end of the transmission line

Marks BT COs
 Level

8 4 2

OR

A 60-Hz alternating voltage having a rms value of 100 V is applied to a series RL circuit by closing a switch. The resistance is 15Ω and the inductance is 0.12 H.

- (a) Find the value of the dc component of current upon closing the switch if the instantaneous value of the voltage is 50 V at that time.
- (b) What is the instantaneous value of the voltage which will produce the maximum dc component of current upon closing the switch?
- (c) What is the instantaneous value of the voltage which will result in the absence of any dc component of current upon closing the switch?

B Explain the behavior of alternator when sudden short circuit occurs.

5 2 2



Q.2 A A set of unbalanced line currents in a three phase four wire system is as follows :

$$I_a = -j6 \text{ A}, I_b = (-8+j5) \text{ A}, I_c = 7 \text{ A}$$

6 3 3

Determine the zero, positive and negative sequence component.

B When a generator has one terminal open and the other two terminals are connected to each other with a short circuit from this connection to ground, typical values for the symmetrical components of current in phase a are $I_{a1} = 600 \angle -90^\circ$, $I_{a2} = 250 \angle 90^\circ$, and $I_{a0} = 350 \angle 90^\circ \text{ A}$. Find the current into the ground and the current in each phase of the generator

6 3 3

