

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 5 – EXAMINATION – SUMMER 2026

Subject Code: 3150911

Date: 06/06/2026

Subject Name: Power System- II

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

- Q.1**
- (a)** What is pu system ? discuss its advantages **03**
 - (b)** Discuss power in single phase AC circuits **04**
 - (c)** Derive expression for sending end voltage and current for long transmission line using rigorous method **07**

- Q.2**
- (a)** Discuss Ferranti Effect **03**
 - (b)** Two single phase loads having $Z_1 = 50 + j 40$ and $Z_2 = 80 - j 30$ connected in parallel and this combination supplied from source 200V , AC. Calculate current drawn and complex power drawn by the load. **04**
 - (c)** Evaluate the generalized circuit constants for medium transmission line — nominal T method **07**

OR

- Q.2**
- (c)** Explain Nominal T and Nominal Π method for analysis of medium transmission line **07**
- Q.3**
- (a)** What are the symmetrical components ? Explain in brief. **03**
 - (b)** Write a short note on selection of circuit breaker. **04**
 - (c)** Explain the zero sequence impedance diagram of transformer for various connection **07**

OR

- Q.3**
- (a)** Show how Z_{bus} gets modified when branch Z_b is added from new bus to old bus. **03**
 - (b)** Explain in detail sub transient , transient and steady state reactance. **04**
 - (c)** Discuss the types of Fault ? derive single line to ground fault. **07**

- Q.4**
- (a)** Explain in brief surge absorber. **03**
 - (b)** What is insulation coordination ? define and explain in brief BIL. **04**
 - (c)** Using appropriate connection of sequence networks , derive the equation for line to line fault in power system. **07**

OR

- Q.4**
- (a)** What is a significance of zero sequence network ? **03**
 - (b)** Explain the phase shift in star delta transformer **04**
 - (c)** What is harmful effect of lightning on a power system ? discuss the different types of lightning strokes ? **07**

- Q.5** (a) Write short note on Arcing Ground Effect **03**
(b) Explain factors affecting the corona. **04**
(c) Explain Reflection and Refraction of Travelling waves at a T-junction on transmission lines. **07**

OR

- Q.5** (a) Explain the following terms with reference to corona : **03**
(i) Critical disruptive voltage
(ii) Visual critical voltage
(iii) Power loss due to corona
(b) Discuss the causes of overvoltage. **04**
(c) What is lightning ? Describe the mechanism of lightning discharge. **07**
