

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (OLD) EXAMINATION – SUMMER 2019****Subject Code: 170903****Date: 16/05/2019****Subject Name: Power System Protection****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.

- Q.1 (a)** Describe the principle of circulating current differential Protection **07**
(b) Enlist causes of faults and differentiate unit type protection and non unit type protection. **07**
- Q.2 (a)** Discuss the important requirements to be satisfied by a protective system. **07**
(b) Explain the working principle of induction type electromagnetic relays. **07**
- OR
- (b)** Why is back up protection required? Discuss different types of back-up protections used. **07**
- Q.3 (a)** Define the following terms as applied to protective relays. (1) **07**
Burden (2) Selectivity and discrimination (3) Reach (4) Plug setting multiplier.
(b) Explain the faults in transformer. Explain the construction and Working Principle of Buchholz relay. **07**
- OR
- Q.3 (a)** Design schematic diagram of carrier current protection of transmission line and describe it. **07**
(b) Restricted earth fault protection is provided to alternators though it does not protect the complete winding against earth faults. Justify this type of protection. **07**
- Q.4 (a)** Discuss the 3 zone protection of transmission lines using impedance relays **07**
(b) Explain under reach and over reach of distance relay. **07**
- OR
- Q.4 (a)** Present characteristics of following distance relays with their applications **07**
(i) Mho relay (ii) off set mho relay (iii) reactance relay.
(b) Explain Differential protection of alternator with diagram. **07**
- Q.5 (a)** Draw the block diagram of a numerical relay and explain the working of each block. **07**
(b) List the type tests carried out on the relays. Discuss any three of them. **07**
- OR
- Q.5 (a)** Explain the installation and commissioning test of relays in brief. **07**
(b) Explain current, time and current-time discrimination methods of protection of transmission line. **07**
