

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (OLD) - EXAMINATION – SUMMER 2017****Subject Code: 162403****Date: 27/04/2017****Subject Name: Switch Gear & Fault Analysis****Time: 10:30 AM to 01:00 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) Define 'fault' in power system. Enlist the causes of fault. Enumerate the various types of fault. How the faults can be minimized? **07**
- (b) Discuss about basic requirement of protection system. Also explain protection zones in brief. **07**
- Q.2** (a) Explain following terms : **07**
- (i) RRRV
 - (ii) Recovery voltage
 - (iii) Restriking voltage
- (b) A 200 MVA, 13.8 kV generator has a reactance of 0.85 p.u. and is generating 1.15 pu voltage. Determine (a) the actual values of the line voltage, phase voltage and reactance, and (b) the corresponding quantities to a new base of 500 MVA, 13.5 kV. **07**
- OR**
- (b) In a short circuit test on a circuit breaker, the following data was obtained on a frequency transient. **07**
- (1) Time to reach the peak restriking voltage 55 μ s.
 - (2) The peak restriking voltage 100 kV.
- Determine the natural frequency of the circuit and average rate of rise of restriking voltage.
- Q.3** (a) Explain the effect and derive the expression of current due to sudden short circuit of R-L series circuit. **07**
- (b) Discuss Resistance Switching & Current Chopping with necessary diagram. **07**
- OR**
- Q.3** (a) List the functions of isolator and earthing switch. Draw the neat sketch of pantograph isolator. **07**
- (b) Discuss air blast circuit breaker with neat diagram. **07**
- Q.4** (a) Explain SF₆ circuit breaker with appropriate diagram. **07**
- (b) Explain construction and working of electromagnetic induction disc relay. Also discuss Plug setting and Time setting in induction disc relay. **07**
- OR**
- Q.4** (a) Explain the double line to ground fault on an unloaded generator. **07**
- (b) Discuss the construction and working of HRC fuse with its advantages and disadvantages. **07**
- Q.5** (a) Explain the principle of distance protection by R-X diagram and explain the operating characteristics of an impedance relay. **07**
- (b) Describe the working of attracted armature relay with necessary diagram. **07**
- OR**
- Q.5** (a) Write a short note on negative phase sequence relay. **07**

- (b) Explain the principle of circulating current differential protection with its advantage and disadvantage. **07**
