Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: 162403 Date: 02-12-2013

Subject Name: Switchgear and Fault Analysis

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)** List the disadvantages of rewireable fuse. Explain the HRC Cartidge fuse. List advantages and disadvantages of HRC Cartidge fuse. **07**

(b) List the advantages and limitations of static relay. **07**

Q.2 **(a)** Define fault. List and explain in brief various abnormal conditions in ac system. Explain the fault clearing process. **07**

(b) Explain the rate of rise of TRV. Derive the equation for restriking voltage. **07**

OR

(b) Explain the current interruption in ac circuit breakers. Draw the oscillogram of current and voltage during fault clearing. **07**

Q.3 **(a)** Define current chopping. Explain the interruption of low magnetizing current. **07**

(b) Explain the construction and working of Single pressure puffer type SF_6 circuit breaker. List the advantages of SF_6 circuit breaker. **07**

OR

Q.3 **(a)** Define electric arc. List the methods of arc extinction and explain the high resistance interruption. **07**

(b) Explain the construction and working of minimum oil circuit breaker. List the advantages and disadvantages of minimum oil circuit breaker. **07**

Q.4 **(a)** Derive the equation of current (complete solution) for sudden short circuit of R-L series circuit. **07**

(b) Explain the single line to ground and double line to ground faults on unloaded generator. **07**

OR

Q.4 **(a)** A balanced star connected load takes 90 A from the balance 3-phase, 4-wire supply. If the fuses in the Y and B phases are removed, find the symmetrical components of the line currents. **07**

(b) Write a technical note on “Induction Disc Relay”. **07**

Q.5 **(a)** Write a technical note on “Attracted Armature Relay”. **07**

(b) List the characteristics of relays for over current protection. Draw the scheme for over current protection with three over current relays. **07**

OR

Q.5 **(a)** Explain the principle of circulating current differential protection. List the difficulties with it. **07**

(b) Explain the directional impedance relay and its torque equation. **07**

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