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## GUJARAT TECHNOLOGICAL UNIVERSITY PDDC - SEMESTER- V<sup>TH</sup> EXAMINATION - SUMMER 2015

Subject Code: X50904 Date: 15/05/2015 **Subject Name: SWITCHGEAR** Time: 02:30 pm - 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** Explain slepain's theory of arc interruption and discuss its limitations. How does 07 (a) energy balance theory explain the process of arc extinction? Explain the phenomenon of current chopping and its effects on circuit **07 (b)** interruption. What measures are taken to reduce it? **Q.2** Explain a trip circuit diagram for the automatic operation of circuit breaker on 07 **(b)** Define the following time quantities related to circuit breaker:(i) Total fault 07 clearing time(ii)Break time(iii)Arcing time(iv)Opening time Explain the duty of circuit breaker for capacitor bank or unloaded transmission 07 **(b)** line switching. 0.3 Explain the construction, working principle, merits and demerits of minimum oil **07** (a) circuit breaker. Explain the construction, working principle, merits and demerits of air blast **07 (b)** circuit breaker OR **Q.3** (a) Explain the principle, construction of vacuum circuit breakers. Also state the 07 merits of VCBs. Explain the construction, working principle, merits and demerits of air break 07 **(b)** circuit breaker Explain the construction, working principle of Puffer type SF6 circuit breaker **07 Q.4** (a) with neat diagram. **(b)** Explain Out of phase switching. 07 OR Discuss the influence of the power factor and circuit conditions on the **Q.4** (a) 07 instantaneous value of recovery voltage. What is resistance switching? Prove, with derivation, that the restriking voltage **07 (b)** can be reduced by incorporating resistance switching in an air blast circuit breaker. **Q.5** What are the different Methods of testing of circuit breakers? What is direct **07** (a) testing? **(b)** What are the various methods of indirect testing? Describe unit testing. **07** Why are short circuit test necessary? What information can be obtained from **Q.5** 07 (a) short circuit tests? Explain how arc is intitated and sustained in a circuit breaker when the circuit **(b) 07** breaker contacts separate.

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