



(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 0200**

Roll No.

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## B. Tech.

(SEM. VII) EXAMINATION, 2008-09

### SWITCH GEAR & PROTECTION

Time : 3 Hours]

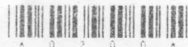
[Total Marks : 100

- Note :**
- (1) Attempt all questions.
  - (2) All questions carry equal marks.
  - (3) Be precise in your answer.
  - (4) No second answer book will be provided.

- 1 Attempt any **two** parts of the following :
- (a) What are primary and back-up protections? 10  
What are various kinds of back-up protections?
  - (b) Draw a neat sketch of an induction disc or 10  
cup type relay and explain its principle of operation.
  - (c) Discuss the working principle, types and 10  
applications of thermal relays.
- 2 Attempt any **two** parts of the following :
- (a) What are the advantages and limitations of 10  
static relays over electromagnetic relays.  
Also discuss the main components of a static relay.



- (b) Describe various types of phase comparators used in static relays. 10
- (c) Classify various types of over current relays and give their applications alongwith their approximate characteristics and general time-current equations. 10
- 3 Attempt any **two** parts of the following :
- (a) Draw and explain the characteristics of a MHO relay. Why a MHO relay is preferred for protection of longlives against phase faults ? 10
- (b) Explain with a suitable example the phenomenon of auto reclosing. 10
- (c) Explain the term 'pilot' with reference to power line protection. What are the different types of pilot schemes which are presently employed in transmission line protection? 10
- 4 Attempt any **two** parts of the following :
- (a) What is the significance of RRRV in operation of a circuit breaker. Also derive the relation for RRRV considering a simple power system. 10
- (b) What are the different tests carried out on a circuit breaker? Differentiate and explain type and routine tests. 10
- (c) What is the difference between direct and indirect testing? Also describe the procedure of indirect testing. 10



Attempt any **two** parts of the following :

- (a) Discuss the behaviour of electric arc in vacuum with the help of a neat diagram. 10  
Explain the construction of a vacuum circuit breaker.
- (b) Explain the construction and working of a puffer type  $SF_6$  circuit breaker. Also enumerate the properties of  $SF_6$  gas which make it a good dielectric and arc quenching medium. 10
- (c) Explain the protection of a three phase star connected generator by means of a percentage differential relay. 10