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Printed Pages—3 **EEE701**

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

PAPER ID : 2734 **Roll No.** | | | | | | | | | | |

B.Tech.

(SEM. VII) ODD SEMESTER THEORY EXAMINATION 2012-13

SWITCH GEAR & PROTECTION

Time : 3 Hours *Total Marks : 100*

Note : *Attempt **all** questions.*

1. Attempt any **four** of the following : **(5×4=20)**

   (a) "A Relay is said to be the brain of protective system." Explain the meaning of this statement. Can a Relay also prevent a fault ? Discuss.

   (b) What do you understand by the 'Zone of protection' of a relay ? What is a 'Blind spot' ? Why is it undesirable in a protection scheme ?

   (c) Draw a 'Trip circuit' including CT, PT, Relay, Battery and Circuit Breaker. Explain its operation.

   (d) Draw neat diagrams for induction disc (wattmetric type) and induction cup relays to explain their operating principles.

   (e) Describe any three major draw backs of electromagnetic relays.

   (f) Discuss about Gas Actuated Relays in detail.

2. Attempt any **two** of the following : **(10×2=20)**

   (a) Enumerate any six major advantages of static relays over electromagnetic relays and explain them.

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(b) Draw neat diagrams to demonstrate 'Trip', 'Restrain' and 'Threshold' conditions for the sine and the cosine types of comparators.

(c) Describe in detail the synthesis of a Mho relay using static phase comparator.

3. Attempt any **two** parts of the following : **(10×2=20)**

(a) Explain with the help of suitable diagrams the effects of arc resistance and power swing on performance of Plane impedance, Reactance and Mho relays.

(b) Differentiate between instantaneous, DTOC and IDMT relays. Explain with the help of a diagram the time graded O.C. protection of a doubly fed feeder.

(c) Write a detailed note on pitot wire protection of a transmission line.

4. Attempt any **four** of the following : **(5×4=20)**

(a) What do you understand by high arc resistance and low arc resistance methods of arc quenching ? Describe the two theories related to arc extinction.

(b) Draw the current and voltage waveforms showing AC circuit breaking phenomenon. Show the following in the diagram and describe them :

(i) Major current loop

(ii) System voltage

(iii) Arc voltage

(iv) Restriking voltage

(v) Active recovery voltage

(vi) Recovery voltage

What do you understand by 'Breaking current' and 'Making current' ?

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(c) Explain with the help of a suitable diagram as to what happens when a current is chopped by a circuit breaker before its natural zero.

(d) What is the difficulty faced while breaking the fault current of a short transmission line ?

(e) Give a detailed description of indirect testing of a circuit breaker.

(f) How are the circuit breakers classified ? Give details of the same.

5. Attempt any **two** of the following : **(10×2=20)**

(a) Draw and describe complete protection of an Alternator.

(b) Draw and describe the operational details of an SF_6 circuit breaker.

(c) Discuss in detail about a d.c. circuit breaker with suitable diagram and waveforms.