

(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) OOD SEMESTER THEORY EXAMINATION
2010-11

SWITCHGEAR AND PROTECTION

Time : 3 Hours

Total Marks : 100

Note : (1) Attempt **all** questions.

(2) All questions carry equal marks

(3) Be precise in your answers.

(4) No Second Answer book will be provided.

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

(a) What is a zone of protection ? Discuss various zones of protection of a power system with the help of line diagram.

(b) What are basic requirements of protective relaying schemes ?

(c) Derive an expression for torque produced in an induction relay.

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

(a) Explain the concept of duality in static comparators.

(b) Discuss the coincidence principle used in phase comparators.

- (c) What do you mean by time multiplier setting (TMS) and plug multiplier setting of an over current relay ? Explain with the help of relay characteristics.

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

- (a) Explain stepped a time-distance characteristics of three distance relaying units used for first, second and third zones of protection.
- (b) Explain the operating principles of pilot wire protection.
- (c) Explain differential protection of a bus using high impedance relay or linear couplers.

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

- (a) Discuss different methods of interrupting the arc current in circuit breakers. Explain two main theories of current zero interruption.
- (b) Discuss the problems associated with the interruption of
- (i) Capacitive current
 - (ii) Fault current if fault is very near to the substation
- (c) Explain the phenomenon of current chopping in a circuit breaker.

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

- (a) Explain with a neat diagram the method of harmonic-current restraint for protection of a transformer.
- (b) A 13.8 kV, 125 MVA, star connected alternator has a asynchronous reactance of 1.4 pu/phase and negligible resistance. It is protected by a Merz-Price balanced current system which operates when out of balance current exceeds 10% of the full load current. If the neutral point is earthed through a 2Ω resistor, determine what portion of the winding is protected against earth fault.
- (c) Discuss the problems encountered in HVDC circuit breaking. Suggest remedies for them.