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

PAPER ID : 0200 Roll No.

B.Tech.

(SEM. VII) OOD SEMESTERTHEORY EXAMINATION 2010-11

SWTICHGEAR 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.

3. 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.

4. 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 2 Ω 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.