

Roll No.

Total No. of Questions : 08]

[Total No. of Pages : 02

M.Tech.

POWER SYSTEM PROTECTION

SUBJECT CODE : PEE - 509

Paper ID : [E0489]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 100

Instruction to Candidates:

- 1) Attempt any **Five** questions.
- 2) All questions carry equal marks.

Q1) Describe in the various protections to be provided to a 30 MVA transformer and a 100 kVA transformer.

Q2) State the possible causes of the following troubles with generators :

- (a) Pitting of bearings.
- (b) Rotor heating.
- (c) Motoring action of generator.
- (d) Over speed of Hydro-generator.
- (e) Rotor unbalanced.
- (f) Loss of excitation.
- (g) Sudden loss of load of generator.

Q3) (a) Describe the principle of high impedance differential protection based on voltage drop.

(b) Describe the interlocked over current protection between generator and bus bar. Explain its necessity.

Q4) (a) State the specifications to be mentioned while selecting a C.T.

(b) What is 'Burden' of a C.T.? Calculate VA output required from a C.T. of 5 A rated secondary current when the burden consist of relay requiring 10VA at 5 A plus loop lead resistance of 0.9 ohms.

- Q5)** (a) Define the term static relay. Give their advantages and disadvantages.
(b) Describe the various types of comparators and their applications.
- Q6)** (a) A star/delta, 22 kV/6.6 kV transformer is protected by means of differential protection system. The 6.6 kV delta side has CT of ratio 750/8. Calculate CT ratio of HT side.
(b) Describe the carrier current protection in details.
- Q7)** Select the suitable relaying method under the following conditions. Give reasons for your selection.
Case (i) Protection of radial feeder from the power station to receiving station. Length of the feeder about 350km. there are two stations in between.
Case (ii) An interconnected line between two power stations 20km apart.
Case (iii) A feeder case (i) but for the following conditions - the line is fed from both the ends and fast relaying is desired for the internal faults.
- Q8)** Describe the procedure of direct testing of three phase circuit breaker for short circuit testing. Explain how is the making capacity, breaking capacity and short time capacity determined.

