



SF-7751

B. E. - IV (Sem - VIII) (Electrical) Examination
May / June - 2011
Power System Protection

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दशांशवैक निशानीवाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="checkbox"/> B. E. - IV (Sem - VIII) (Electrical)	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="checkbox"/> Power System Protection	<input type="text"/>
Subject Code No. : <input type="text"/> 7 <input type="text"/> 7 <input type="text"/> 5 <input type="text"/> 1	Section No. (1, 2,.....): <input type="text"/> Nil
Student's Signature	

- (2) Figures to the right side indicate full marks.
(3) Supplement answer with help of neat sketches wherever necessary.
(4) Make assumptions wherever you feel required.
(5) Attempt all questions.

- 1 (a) Fill in the blanks by inserting appropriate words/figures. 4
- The minimum relay coil current at which relay operate is called _____.
 - Bychholz relay is a _____ relay.
 - If the fault current is 2000 A the relay setting is 50% and CT ratio is 400/5. The plug setting multiplier will be _____.
 - Earth fault relays have _____ current setting than over current relays.
- (b) Answer in short. 6
- Define following terms.
 - Overshoot time
 - Reset value.
 - Give the application of directional over current relay.
 - Explain difference between fuse and protective relay.
- (c) What are the rotor faults in an alternator ? For such 10 faults give their causes and suggest protective measures.

- 2 (a) Write a short note on thermal relay. 8
 (b) Describe testing of relay. 8

OR

- 2 (a) Write a short note on merits of static relay over electromagnetic relay 8
 (b) Describe construction, principle and operation of induction type over current relay. 8

- 3 Attempt any **two** : 14

- (a) Explain the terms (i) plug setting multiplier and (ii) time setting in connection with IDMT relays. What are their significances in relay operation ?
 (b) Describe protection scheme of an alternator against inter turn fault.
 (c) Explain main and backup protection and also describe different kinds of backup protection schemes used in power system.

- 4 (a) Fill in the blanks by inserting appropriate words/figures. 4

- (i) _____ distance relay has inherent directional characteristic.
 (ii) Magnetising inrush current in transformer is rich in _____ harmonic component.
 (iii) The tendency of a impedance relay to operate at impedance _____ than its setting value is known as over reach.
 (iv) The differential protection scheme of an alternator will have a _____ bias setting than that of transformer.

- (b) Answer in short. 6

- (i) What is PLCC ?
 (ii) Justify : There is no need to provide harmonic restrain with overall differential protection of generator transformer.
 (iii) What are the faults that are likely to occur in a power transformer ?

- (c) Explain the phase comparison method of carrier current 5 protection.

- (d) Describe torque equation for reactance relay and also 5 derive the condition for operation of reactance relay.

- 5 (a) Draw and explain the percentage differential protection scheme for Delta-star transformer with CTs connections. 8
(b) Write a short note on Harmonic restraint relay for power transformer. 7

OR

- 5 (a) Explain Buchholz relay with schematic diagram with reference 8
(i) Principle of operation
(ii) Merits
(iii) Limitations.
(b) Write a short note on Restricted earth fault protection for power transformer. 7

- 6 Attempt any **three** : 15
(a) What are the different types of faults taking place on the busbars ? Also discuss voltage differential protection used for busbars.
(b) Write a short note on mho relay.
(c) Explain the directional comparison method of carrier current protection.
(d) Discuss overreach and underreach in connection with distance relay.
(e) Write a short note on a three stepped distance protection.