



RM-7751-R

B. E. IV (Sem. VIII) (Electrical) Examination

April / May – 2010

Power System Protection

Time : 3 Hours]

[Total Marks : 100

Instruction :

(1)

नीचे दशांशवले 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="text" value="B. E. 4 (Sem. 8) (Electrical)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="Power System Protection"/>	<input type="text"/>
Subject Code No. : <input type="text" value="7"/> <input type="text" value="7"/> <input type="text" value="5"/> <input type="text" value="1"/>	Section No. (1, 2,.....) : <input type="text" value="1&2"/>
Student's Signature	

- (2) Figures to the **right** indicate full marks.
- (3) Supplement answer with help of neat sketches wherever **necessary**.
- (4) Make assumptions wherever you feel required.
- (5) Answer to the **two** sections must be written in **separate** answer books.

SECTION - I

- 1 (a) Answer in short : 6
 - (i) Explain difference between fuse and protective relay.
 - (ii) Give the application of directional over current relay.
 - (iii) Define following terms.
 - (a) Pick up current
 - (b) Reset value
- (b) Fill in the blanks by inserting appropriate words / figures : 4
 - (i) Preventing the protective relay from tripping is known as _____
 - (ii) Relay used in differential protection should operate only for _____ faults.
 - (iii) A 1 VA relay is _____ sensitive than a 3VA realy.
 - (iv) The main cause of over speed in alternator is _____
- (c) Write short note on loss of excitation of alternators. 8

- (d) Explain the terms sensitivity and selectivity with respect to their use in the protective relaying field. **2**
- 2** (a) Describe construction, principle and operation of induction type over current relay. **8**
- (b) What are the abnormal conditions in large alternator? Explain protection against various abnormal conditions in brief. **8**

OR

- 2** (a) Explain various test on CTs and PTs **8**
- (b) Explain the thermal relay with the help of sketch. **8**
- 3** Attempt any **two**. **14**
- (a) Compare static relay with electromagnetic relay.
- (b) Explain primary and secondary injection methods of testing protective gear.
- (c) Explain biased differential protection for alternators.

SECTION - II

- 4** (a) Answer in short (3 to 4 lines) **10**
- (i) Justify : There is no need to provide harmonic restrain with differential protection of generator transformer.
- (ii) Differential relay should be connected at the equipotential points on the pilot wires. Why?
- (iii) List out the complete family of distance relays.
- (iv) What is PLCC?
- (v) Justify: Pilot-wire differential protection scheme can be applied only to short-transmission lines.
- (b) Discuss: Different principles of carrier current protection applied for transmission line in brief. **5**
- (c) Giving torque equation for an impedance relay, derive the condition for operation of this relay. **5**
- 5** (a) Write a short note: Restricted earth fault protection for transformer. **8**
- (b) Discuss the different transformer faults. What are the various protection schemes available for transformer? **7**

OR

- 5 (a) What is magnetic inrush in case of transformers? 8
Discuss inrush phenomenon along with diagrams and mathematical derivations.
- (b) Why is a harmonic restrained relay required for 7
protecting a large transformer? Describe the construction and working of harmonic restrained relay.
- 6 Answer any **three** : 15
- (i) Discuss the suitability of traditional distance relay characteristics under power swing condition and also suggest the method for further improve the performance most suitable of these characteristics.
- (ii) What are the different types of faults taking place on the bus-bars? Also discuss frame leakage (earth) protection used for bus-bars.
- (iii) Describe one method of carrier aided distance protection.
- (iv) Write a short note on reactance relay.
- (v) Discuss the various problems faced in the over current protection scheme of transmission lines in short.
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