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JK Lakshmipat University, Jaipur

Institute of Engineering and Technology

End Term Examination

B.Tech. (EE)-V Semester-2013



Course Name: Power System Switchgear & Protection
Course Code: EE 502

Max marks: 40
Time: 03 Hr

Instructions to the candidate:

1. Section A and Section C is a compulsory question.
2. Attempt any two questions from Section B
3. All parts of same question must be attempted in continuity.

Section A

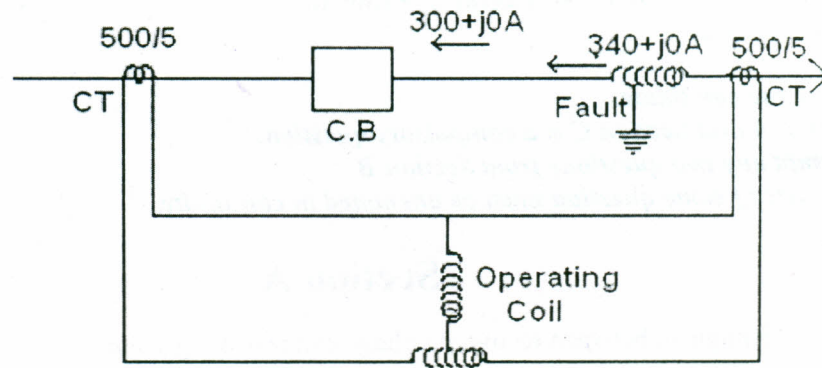
- Q(1.) (a) Distinguish between recovery voltage and restriking voltage [02]
(b) Give the advantage of SF₆ circuit breaker over Air blast circuit breaker [02]
(c) A relay is connected to 400/5 ratio current transformer with current setting of 150%. Calculate the Plug Setting Multiplier when circuit carries a fault current of 4000 A [02]
(d) What is current Chopping? Explain how can the effect of current chopping be minimized? [02]
(e) Explain in detail the various methods of arc extinction in a circuit breaker [02]

Section B

- Q(2.) (a) Explain various methods used for busbar protection. [04]
(b) Explain protection scheme used in star/star & star/delta transformers against through fault & internal fault for grounded & ungrounded conditions. [06]
- Q(3.) (a) Explain with a neat sketch, the construction and working of minimum oil circuit breaker. Also give its merits and demerits [04]
(b) Describe the Merz-price circulation current scheme for protection used For power transformer. [06]
- Q(4.) (a) State four limitation of differential protection of alternator [02]
(b) An alternator stator winding protected by a percentage differential relay is as shown below. The relay has 15% slope of characteristics ($I_1 - I_2$) against ($I_1 + I_2$) [08]

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I_2)/2. The high resistance ground fault has occurred near the grounded neutral end of the generator winding while the generator is carrying load. The currents flowing at each end of the generator winding are also shown. Assuming C.T. ratio to be 500/5 A, will the relay operate to trip the circuit breaker?



Section C

- Q(5.) (a) Draw and explain the Merz –Price protection scheme for, [03]
- (i.) Star Delta Transformer
 - (ii.) Delta Delta Transformer
 - (iii.) Star Star Transformer
- (b) A generator is protected by restricted earth fault protection. The generator [07]
ratings are 13.2kv, 10MVA. The percentage of winding protected against phase
to ground fault is 85%. The relay setting is such that it trips for 20% out of
balance calculate the resistance to be added in the neutral to ground connection