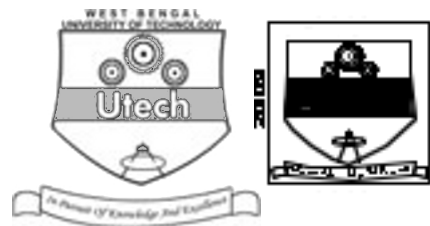


POWER SYSTEM PROTECTION (SEMESTER - 8)

CS/B.Tech(EE)/SEM-8/EE-802(I)/09



1.
Signature of Invigilator

2.
Signature of the Officer-in-Charge

Reg. No.

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Roll No. of the
Candidate

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CS/B.Tech(EE)/SEM-8/EE-802(I)/09
ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009
POWER SYSTEM PROTECTION (SEMESTER - 8)

Time : 3 Hours]

[Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

- This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
- In **Group – A**, Questions are of Objective type. You have to answer the questions in the space provided marked '**Answer Sheet**'.
 - For **Groups – B & C** you have to answer the questions in the space provided marked '**Answer Sheet**'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
- Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
- Read the instructions given inside carefully before answering.
- You should not forget to write the corresponding question numbers while answering.
- Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
- Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
- You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
- Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

Group – A								Group – B				Group – C				Total Marks	Examiner's Signature
Question Number																	
Marks Obtained																	

.....
Head-Examiner/Co-Ordinator/Scrutineer

8879/EE-802-I (27/04)



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ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL - 2009

POWER SYSTEM PROTECTION

SEMESTER - 8



Time : 3 Hours]

[Full Marks : 70

GROUP - A

(Objective Type Questions)

1. Fill in the blanks : 10 × 1 = 10
- i) A relay performs the function of
 - ii) The relay operating oil is supplied through
 - iii) The pick up value of relay is 7.5 A and fault current relay is 30 A. Plug setting multiplier is
 - iv) Back-up protection is generally of type (Unit/Non-unit).
 - v) For the protection of a delta/star transformer, the C.T.s on delta side must be connected in and those on the star side in
 - vi) Differential protection scheme for longer lines costly.
 - vii) Transients on the power system due to current chopping are taken care of by
 - viii) The minimum number of C.T.s for protection of unattended sub-station are
 - ix) The loss of excitation in alternator is protected by relay.
 - x) The most important starter winding fault of an alternator is fault.



4

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.



3 × 5 = 15

2. What is carrier current protection ? For what voltage range is it used for the protection of transmission lines ? 5

3. An 11 kV, 100 MVA alternator is provided with differential protection. The percentage of winding to the protected against phase to ground fault is 85%. The relay is set to operate when these are 20% out of balance current. Determine the value of the resistance to be placed in the neutral to ground connection. 5

4. What is the necessity of protecting electrical equipment against travelling waves ? Briefly describe the protective devices used for such protection. 5

5. Explain series and shunt trip circuit breakers. Draw the connection diagram of them. 5

6. What is the difference between Protection C.T. and Metering C.T. ? Which part of B-H curve is used for these current transformer ? 5

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following.

3 × 15 = 45

7. What is insulation coordination ? Explain insulation coordination for a power substation with diagram.

8. Explain what you understand by Primary and Back-up protection. What is the role of back-up protection ? What are the various methods of providing back-up protection ?



9. What is meant by transient overreach as applied to high set instantaneous over current relays ? Explain. What measures are to be taken to overcome from this difficulty ?
10. Deduce the generalized equation of an Amplitude Comparator for distance protection. What is your explanation about the nature of operating and restraining signals ?
11. Draw and explain the circuit diagram for a differential protection scheme of a transformer. What types of faults can be protected with this scheme ?

=====

END