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# GANESH COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)
Attur Main Road, Mettupatti, Salem - 636 111, Tamilnadu, India
Phone: 0427 - 2211212, +91 9865440414
E-Mail: principal@ganeshenggcollege.org www.ganeshenggcollege.org

2.5.1 – Mechanism of internal assessment is transparent and robust in terms of frequency and mode.

| S. No | Content |
|---|---|
| 1 | Academic Calendar of Anna University |
| 2 | Test Schedule of the Institution |
| 3 | Internal Assessment System – Flow Chart |
| 4 | Procedure for awarding internal marks for theory subjects |
| 5 | Sample document for term test question paper |
| 6 | Procedure for awarding internal marks for practical subjects |
| 7 | Sample document for model practical exam question paper |
| 8 | Procedure for awarding marks for final project work |
| 9 | Sample documents for students project presentation during project review |
| 10 | Sample Answer Sheets |

Date: 13.07.2023

# CENTRE FOR ACADEMIC COURSES

## ANNA UNIVERSITY: : CHENNAI – 600 025

## ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

### July 2023 – November 2023 (ODD SEMESTER – Except Semester III)

UG / PG Programmes

| Sl. No. | Programme | Semester | Commencement of Classes | Last working day | Commencement of Practical Examinations | Commencement of End Semester Examinations |
|---|---|---|---|---|---|---|
| 1. | B.E. / B.Tech.(Full-Time) | V, VII | 27.07.2023 | 17.11.2023 | 20.11.2023 | 29.11.2023 |
| 2. | B.E. / B.Tech.(Part-Time) | V, VII | | | | |
| 3. | B.Arch.(Full-Time) | V, VII, IX | | | | |
| 4. | M.B.A.(5 years Integrated) | V, VII, IX | | | | |

**RE - OPENING DAY FOR THE NEXT SEMESTER: 22.01.2024 (Monday)**

**NOTE:**

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

13/7/2023

DIRECTOR
ACADEMIC COURSES

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DAC - SB

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## GANESH COLLEGE OF ENGINEERING

## DEPARTMENT OF EEE

## TIME TABLE FOR COACHING & MODEL EXAM-1

COACHING TIME: 9.00AM TO 12.15PM, EXAM TIME: 1.25PM TO 4.25PM

## YEAR / SEMESTER: III / VII

| S. No | DATE | SESSION | SUB.CODE | NAME OF THE SUBJECT | NAME OF THE COACHING FACULTY | NAME OF THE INVIGILATING FACULTY | EXAM VENUE |
|---|---|---|---|---|---|---|---|
| 1 | 01.11.23 | FN & AN | EE8701 | High Voltage Engineering | Mrs.C.Surya | Mr.M.Karthikeyan & Mr.T.Vinoth Raj | 1 - 20 (S1) |
| 2 | 02.11.23 | | EE8702 | Power System Operation and Control | Mrs.G.Visalakshi | Mrs.C.Surya & Mrs.N.Renuka Devi | 1- 20 (S2) |
| 3 | 04.11.23 | | EE8703 | Renewable Energy Systems | Mrs.M.C.Karthikeyan | Mrs.G.Visalakshi & Mr.T.Vinoth Raj | 1-20 (S3) |
| 4 | 05.11.23 | | EE8003 | Power System Transients | Mrs.N.Renuka Devi | Mr.M.Karthikeyan & Mrs.C.Surya | 1-20 (S1) |
| 5 | 07.11.23 | | GE8071 | Disaster Management | Mr.T.Vinoth Raj | Mrs.M.C.Karthikeyan & Mrs.N.Renuka Devi | 1-20 (S3) |

Note:

1: Maximum marks allotted for each examination is 100.

2: Anna University's end semester question paper will be followed.

3: No alteration is allowed without getting prior approval from the Head.

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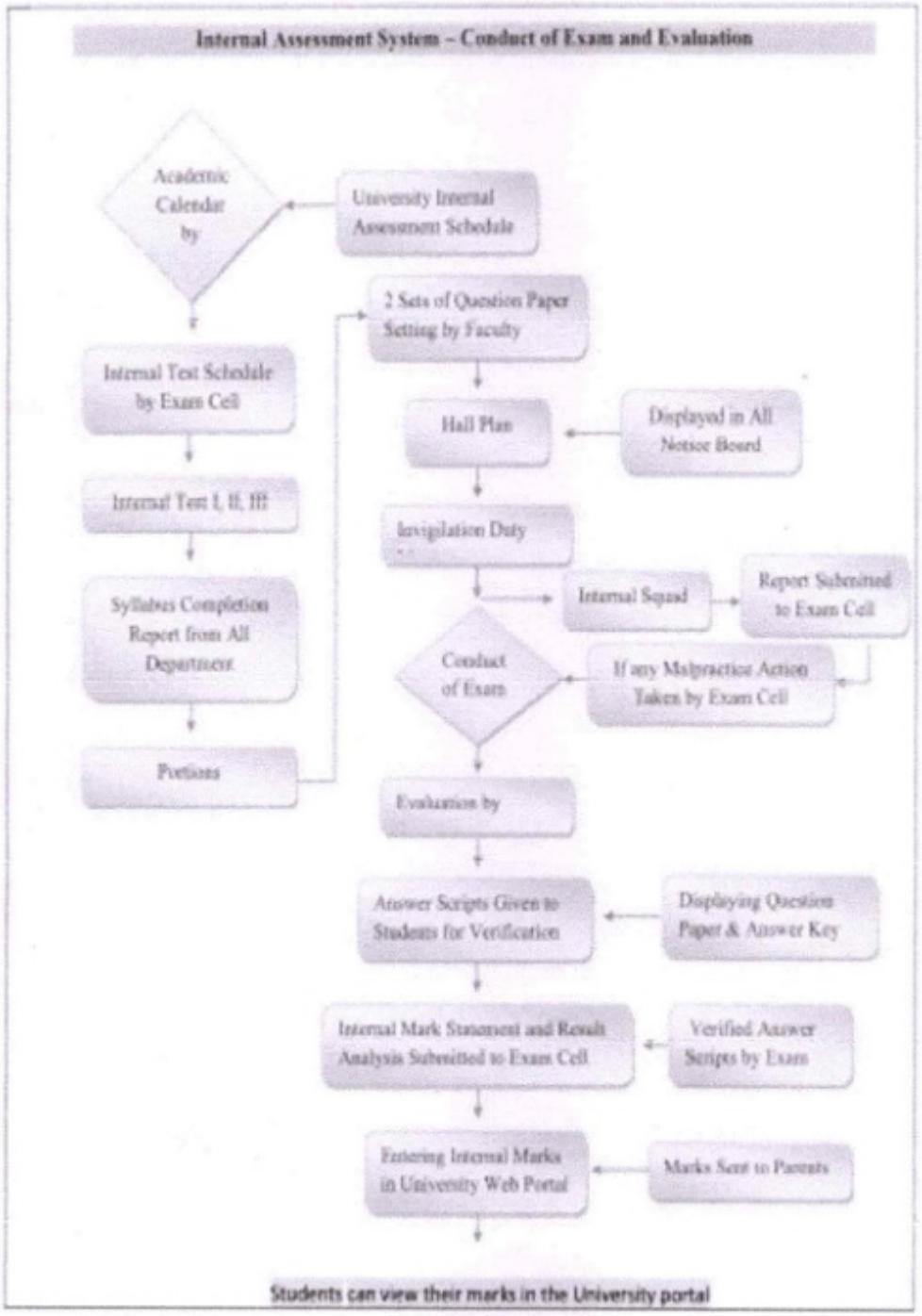


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# PROCEDURE FOR AWARDING INTERNAL MARKS FOR THEORY SUBJECTS

## CONTINUOUS ASSESSMENT

The institute believes firmly in continuous evaluation of the students for their sustained performance. Hence a structured evaluation process has been designed and implemented. The tests are prepared and conducted as per the requirement of University. To prepare students for practical and oral examinations, institute conducts mock Practical exams.

## THEORY COURSES

The internal assessment marks for the theory subjects are calculated based on the three term tests. Internal tests are conducted as per the academic schedule of Anna University. Each test carries maximum of fifty marks and cumulative becomes 150 marks. This 150 mark is divided uniformly across all COs of the course. The total marks obtained in all tests put together out of 150, shall be proportionately reduced for 20 marks and rounded to the nearest integer (This also implies equal weight age to all the three tests). Questions for the term tests are taken by following the Bloom's Taxonomy. Bloom's Taxonomy helps educators to identify the intellectual level at which individual students are capable of working. It also helps them ask questions and create instruction aimed at critical thinking by striving to reach the top three levels of analysis, synthesis and evaluation with students ready for those levels.

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ATTUR MAIN ROAD, METTUPATTI, SALEM-636 111

| | | | |
|---|---|---|---|
| **Class/Dept:** | **IV/ EEE** | **Duration:** | **1.30Hr** |
| **Date:** | **01.11.2023** **Session: (AN)** | | |
| **Subject Code:** | **EE8701** | **Marks:** | **50** |
| **Subject Name:** | **High Voltage Engineering** | | |

| S. No | Questions | Blooms Taxonomy Level | Course Outcomes |
|---|---|---|---|
| | **Answer All Questions** | | |
| | **Part A – (10x2=20 Marks)** | | |
| 1 | What is meant by Lightning phenomenon. | Remember | CO1 |
| 2 | List out the different methods employed for protection of over head line against lightning. | Remember | CO1 |
| 3 | What is meant by equivalent circuit of surge diverter. | Remember | CO1 |
| 4 | List out the sources of switching over – voltage in power system | Create | CO1 |
| 5 | Define Isokeraunic level. | Remember | CO1 |
| 6 | What is meant by corona? | Remember | CO1 |
| 7 | State the electronegative gases? | Remember | CO2 |
| 8 | Define treeing and tracking. | Remember | CO2 |
| 9 | State the intrinsic strength. | Remember | CO2 |
| 10 | Point out the uses of gas insulators? | Remember | CO2 |
| | **Part B – (3X10 = 30 Marks)** | | |
| 11. a) | Demonstrate the mechanism of lighting strokes inducing high over voltage on transmission lines and what are sources of switching surges. | Analyzing | CO1 |
| 11. b) | Briefly explain the technique of lightning modeling. | Applying | CO1 |
| 12. a) | Analysis the various breakdown theories involved in commercial liquid dielectrics. | Analyzing | CO1 |
| 12. b) | Explain the phenomenon of corona discharge and breakdown mechanism in non –uniform fields. | Analyzing | CO1 |
| 13. a) | Conclude in details about the protection of transmission lines against over voltage. | Creating | CO1 |
| 13. b) | Evaluate the characteristics of liquid dielectrics. | Creating | CO1 |

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# PROCEDURE FOR AWARDING INTERNAL MARKS FOR PRACTICAL SUBJECTS

The maximum marks for Internal Assessment shall be 20 in case of practical courses. Every practical exercise / experiment shall be evaluated based on conduct of experiment / exercise and records maintained. There shall beat least one test. The criteria for arriving at the Internal Assessment marks of 20 areas follows: 75 marks shall be awarded for successful completion of all the prescribed experiments done in the Laboratory and 25 marks for the test. The total mark shall be reduced to 20 and rounded to the nearest integer.

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# SAMPLE DOCUMENT FOR MODEL PRACTICAL EXAM QUESTION PAPER

B.E/B.Tech.PRACTICALENDSEMESTEREXAMINATIONS

SeventhSemester

**EE8712RenewableEnergySystemsLaboratory**

(Regulations2017)

Time:3 Hours AnsweranyoneQuestion Max. Marks100

| Aim/Principle/Apparatus required/Procedure | Tabulation/Circuit/ Program/Drawing | Calculation &Results | Viva-Voce | Record | Total |
|---|---|---|---|---|---|
| 20 | 40 | 20 | 10 | 10 | 100 |

1. Designandimplementofaparallelseriescombinationofthe SolarPVEnergySystemusing matlabSimulink.
2. Conductanappropriateexperimentfor1kWpSolarPVsystemanddeterminethev-icharacteristics andefficiencyof thePVsystem.
3. Conductanappropriateexperimentfor1kWpSolarPVsystemI-VandP-VcharacteristicswithseriesandParallel combinationof modules.
4. ConductPVcellexperimentstodetermine shading lossesanddiodebased solutionin1kWpSolar PVsystem.
5. Conduct PV cell experiments using MPPT algorithm find the Vmax, Imax and Pmax ,Efficiencyanddutycycle.
6. Designandimplementagrid-connected1kWpSolarpowersystemandassesstheperformanceof thesolar power system.
7. Designandimplementastandalone1kWpSolarenergysystemandassesstheperformanceof thesolar energysystem.
8. Analyzeandstudyof thedouble-fedinductiongeneratorusingsimulationblocks.
9. Conduct an appropriate experiment to evaluate the practical design andperformanceof themicro-windturbine.

10. Designandimplementofananalysisofthepowerperformanceofthemicro-windenergygenerator.

11. ConstructaPVhybridpowersystemusingtheSimulinkmatlabandanalyzetheoutputof the hybrid powersystem.
12. Designandsimulatetheimplementationofasolarhybridrenewableenergysystembyconductingsuitableexperiment.
13. Conductanappropriateexperimenttoevaluatetheperformanceofthehybridsolarwind powersystem.
14. BysuitabletoolsperformModellingandsimulationofthemicroHydelpowerplantusing Matlabsimulation.
15. Conduct an appropriate experiment for evaluation and simulation of a commercial100Wfuelcellstack.
16. Conductsuitableexperimenttodesignanddevelopaportablefuelcellof100wattsandto performthehydrogen/currentcharacteristicsofthe100WFuelCell.
17. Buildanappropriateexperimentinthemodellingandsimulationofsmarthybridenergysources basedonsolar andfuelcells.
18. Buildanappropriate experimentinthemodellingandsimulationofintelligenthybridenergysourcesbasedon themicro-windenergygeneratorandfuelcell.

G. Visalaceem 19/5/23
INTERNAL EXAMINER
(G. VISALAKSHI, ASP/EEE)
6206 - GCE.

19/5/23.
EXTERNAL EXAMINER

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# PROCEDURE FOR AWARDING MARKS FOR FINAL PROJECT WORK

Procedure for awarding marks for final project work:

Project work will be allotted to a single student or to a group of students not exceeding 4 per group. The Head of the Institutions shall constitute a review committee for project work for each branch of study. Project will be guided by a faculty member of the department, who is designated at least to the minimum cadre of Assistant Professor. There shall be three reviews during the semester by the review committee. The student shall make presentation on the progress made by him / her before the committee. The total marks obtained in the three reviews shall be reduced for 20 marks and rounded to the nearest integer. The marks allotted to the each review is presented in the below table. The Internal marks approved by the Head of the Institution shall be displayed by the respective HODs within 5 days from the last working day.

| Review I | Review II | Review III |
|---|---|---|
| 5 | 7.5 | 7.5 |

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# EVALUATED SAMPLE TEST PAPER

48/50

Name : S. Siva
Reg No : 620620105006
Sub : High Voltage Engineering
Subcode : EE 8701

Internal Assessment Test - 1

PART-A

1.

Switchgear :

Switchgear is a combination of electrical device like Switches, circuit breaker, and fuses used to isolate, protect and control electrical equipment and circuit.

2

2. Function of Isolating Switching

Isolating Switching Separate a portion of the electrical System for maintenance or troubleshooting, ensuring the Safety of

Personnel and equipment.

3.

## Source of fault Power

The Source of fault power is typically the Power Supply System itself, including Generators, transforms, and interconnected Transmission line

4. Consequence of Short Circuit:

High fault Current leading to damage to equipment

System instability or blackout

Potential fire hazards and Safety risks.

5. Merits of Resistance Grounded System:

Reduces the risk of arc flash hazards

Limits function fault current to Prevent damage to equipment

Improves System Stability and fault detection

6. Necessity for Earthing:

To ensure the Safety of Personnel by Preventing electrical Shock

To Protect electrical equipment from damage caused by fault current.

7. Two Disadvantage of Carrier Scheme for transmission Line only

High initial cost and maintenance

Susceptibility to interference from external Signal

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8. Over Current and under Current

Over Current relay :-

Operate when Current exceeds a preset Value

under Current relays :-

Operate when Current falls below a Preset value

9. Two Application of Differential Relays :-

Protection of transformer against internal fault

Protection of generator and busbars

10. Purpose of Plug Setting

Plug setting adjusts the pickup current level of a relay to customize its sensitivity for specific protection requirements

PART-B

11. a) Different type of fault:-

The fault in the Power System is defined as the defect in the Power System due to which the current is distracted from the intended path.

The fault in the power system is mainly Categorised into two types

1. open circuit Fault
2. Short Circuit fault

1. Open Circuit Fault:-

The open Circuit fault mainly occurs because of the failure of one or two conductor

The open circuit fault takes place in Series with the Line, and because of this it is also called the Series fault.

The open circuit fault is categorised as

Open Conductor Fault

Two conductor open fault

three conductor open fault

2. Short - Circuit Fault:-

In this type of fault the conductor of the different phase come into contact with each other with a power line, power transformer or any other circuit element due to which the Large current flow in one or two phase of the system.

Symmetrical Fault:-

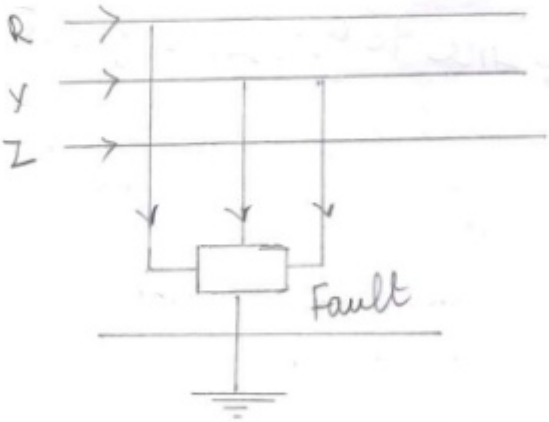
The fault which involve all the three phase is known as the Symmetrical fault

The Symmetrical fault is Sub-Categorized.

1. Line to Line fault
2. 3 Line to Ground

## 1. Line to Line fault:-

Such type of fault are balanced, the System remains Symmetrical even after the fault. The L-L-L Fault occurs rarely but it is the most severse type of fault which invdle the Largest current




## 2. 3 Line to Grocoundt:-

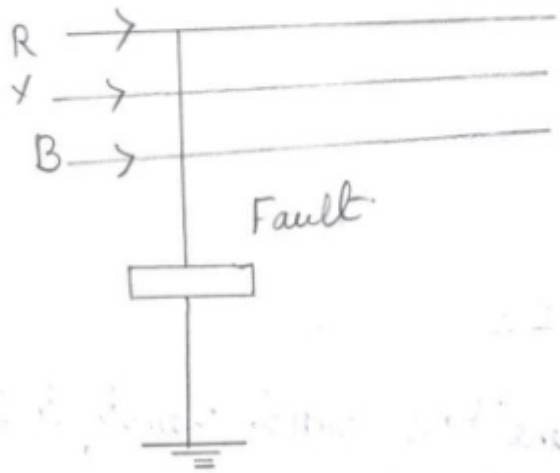
The 3$\phi$ tine to Ground Fault include all the three phase of the System

The L-L-L-G1 Fault occurs b/w the three phase and the ground of the System

## Unsymmetrical Fault:

The Fault gives rise to unsymmetrical Current differering in magnitude and phase in the three phase of the Power System are known unsymmetrical fault

1. Single Line to ground Fault
2. Line to Line Fault
3. Double Line to ground fault



12.a) Fault in different equipment:-

1. Transformers:-

Overloading:-

Operating above the rate capacity less Lead to overheating and insulation Failure

Insulation Failure:-

Caused by aging, moisture, ingress, or vtg Surges.

Short Circuit:-

Internal Fault due to winding or Core insulation breakdown

Oil Contamination:-

Deterioration in dielectric Strength due to moisture or impurities

Cooling System Failure

Ineffective cooling can Result in overheating

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2. Generators:-

Over heating:- Caused by poor ventilation or high load

Insulation Breakdown:- Due to Vtg Spikes or Prolonged operation under high temperature

Rotor issues:- Unbalanced rotor or damaged winding

Lubrication Failure:- Leads to bearing damage and mechanical Fault.

3. Motor:-

overLoading:-

Running the motor above rated Load Capacity

Electrical Fault:- Stator or rotor winding Failure

Mechanical Fault:- Worn bearing, Misalignment, or coupling Failure

Power Supply Issues:- Vtg imbalance or phase failure

4. Switchgear and Circuit breaker:-

Overcurrent:-

Exceeding current limits can Cause Circuit breaker

Mechanical wear:-

Frequent operation Causing Contact wear.

10

15. Overvoltage Protection of overhead Transmission Line:

Transmission Line overvtg Protection against natural or lightning overvtg and minimizing the Lightning overvtg are done by Suitable line design, Providing guard and Ground wire, and using Surge diverter

Protection against Lighting overvtg and Switching Surges:

Shielding the overhead line by using Ground wire above the Phase wire

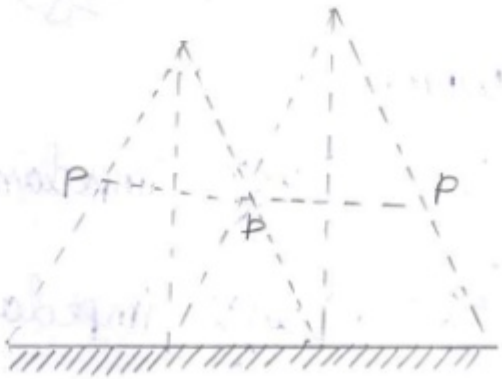
Using ground rod and Counter - Poise wire

Including protective device like expulsion gap, Protector tube on the Line

## a) Lightning protection using Shielded wires

Ground wire a conductor run Parallel to the main conductor of the transmission line Supported on the Same tower and earthed at every equally and regularly Spaced towers.

It is run above the main conductor of the line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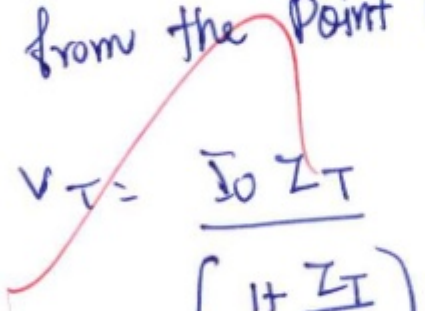
## b) Protection using Ground Rods and Counter.

when a line is shielded the lighting Strikes either the tower or ground wire

The Path for dirainage of the charge and lightning current

a) Through the lower frame to ground

b) Through the ground line in opposite direction from the Point of Striking



$$V_T = \frac{I_0 Z_T}{\left(1 + \frac{Z_I}{Z_S}\right)}$$

where

$Z_T$ = Surge impedance of the tower

$Z_S$ = Surge impedance of the Ground wire

c) Protective Device:-

In region where lighting storokes are intense or heavy the overhead line within these zones are fitted with shunt protected device

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