MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)
Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

Department of Electrical and Electronics Engineering
Question Bank - Academic Year (2020-21)

Course Code & Course Name : 19EEC12 & Transmission and Distribution

Name of the Faculty : M.Selvakumari

Year/Sem/Sec : III/V/A&B

Unit-I: Structure of power system
Part-A (2 Marks)

1. Sketch the single-line diagram of electric power system.
2. Why high voltages are preferred for power transmission?
3. List the requirements of distribution system.
4. What is ring main system?
5. Define the terms feeder and service mains.
6. What are the methods of feeding dc distributor?
7. Justify why the transmission lines are 3-Φ, 3 wire circuit while distribution lines are 3-Φ, 4 wire circuits?
8. Why DC is used instead of AC for a long transmission line network?
9. Compare EHVAC and HVDC transmission systems.
10. What is the necessity for FACTS? List the advantages of FACTS controllers.

Part-B (16 Marks)

1.		Draw and explain the structure of modern power system with typical voltage levels.	(16)
2.	(i)	Derive the expression for voltage equation for the DC distribution network fed at both the ends.	(8)
	(ii)	Explain the various types of dc distributors.	(8)
3.		Explain the different types of FACTS controllers	(16)
4.		Explain the EHV system with the aid of a neat sketch. Justify the merits of EHVAC transmission.	(16)
5.	(i)	Narrate the principle of HVDC system and the types of HVDC links & discuss the merits, demerits and applications of HVDC transmission.	(8)
	(ii)	Discuss the advantages/technical merits of HVDC over HVAC system.	(8)

Unit-II : Transmission line parameters
Part-A (2 Marks)

1. What is transposition? Why is transmission lines transposed?
2. What is ACSR conductor?

3. Distinguish between bundled and stranded conductors.
4. List the concept of bundled conductors.
5. Why the concept of self GMD is not applicable for capacitance calculations?
6. What are the factors influencing communication/telephone interference?
7. State the skin effect in transmission lines. Mention its effect on the resistance of the line.
8. What is meant by proximity effect?
9. Define the terms disruptive and visual critical voltage.
10. What are the methods adopted to reduce carona?

Part-B (16 Marks)

1. Derive the flux linkages with conductor per phase, for the inductance per phase of a three phase overhead transmission system when the conductors are regularly transposed. (16)
2. Explain the concept of self GMD and mutual GMD for evaluating the inductance of the transmission line. (16)
3. Derive the expression for the capacitance of a single core cable. (16)
4. Derive the expression for the capacitance of a three phase overhead transmission system when conductors are symmetrically and unsymmetrically spaced. (16)
5. Explain the formation of Carona, factors affecting Carona loss, and methods of reducing carona loss. (16)

Unit-III : Modelling and performance of transmission lines

Part-A (2 Marks)

1. Explain about the performance of the transmission lines. How is transmission lines classified?
2. Define voltage regulation in transmission lines.
3. Define transmission efficiency.
4. Differentiate between nominal T and nominal $\prod$ methods.
5. Derive the surge impedance in a transmission line.
6. What is surge impedance loading?
7. List the significance of SIL in transmission line.
8. Distinguish between attenuation and phase constant.
9. What is Feranti effect?
10. Draw the phasor diagram to narrate Ferranti effect.

Part-B (16 Marks)

1. Draw the phasor diagram of a short transmission line and derive an expression for voltage regulation and transmission efficiency (16)
2. Deduce an expression for the sending end and receiving end power of a transmission line interms of voltages and ABCD constants (16)
3. Derive the expression for voltage and current at any point x from the receiving end of the transmission line (16)
4. Explain briefly about the suspension and pin type insulators with the help of schematic (16)

diagram

5. What are the different methods available for voltage control and explain any one method (16)

Unit-IV : Under ground cables

Part-A (2 Marks)

1. What are the main requirements of the insulating materials used for cables?
2. Compare underground and overhead cables.
3. Why insulators are used in overhead lines?
4. What are the tests performed on the insulators?
5. What are the causes of failure of insulators?
6. Define string efficiency.
7. What are screened and belted cables?
8. Define grading of cables.
9. What is capacitance grading in a cable?
10. State the affects of unequal distribution of stress in a cable.

Part-B (16 Marks)

1. Describe the general construction of an underground cable with a neat sketch (16)
2. With neat diagram, explain the various methods of grading of underground cables (16)
3. Derive an expression for the insulation resistance, capacitance and the electrostatic stress of a single core cable (16)
4. Explain the methods of grading of cables with neat diagrams and equations (16)
5. Power factor in cables & Insulation Resistance of single core cable and Heating in cables & DC cables (16)

Unit-V : Mechanical design of lines & grounding

Part-A (2 Marks)

1. Define Sag.
2. Enlist any two factors that affect sag in the transmission line.
3. What are the various methods of voltage control?
4. Why high voltages are preferred for power transmission?
5. What are the various methods of voltage control?
6. List the causes of low power factor and are the various methods of power factor improvement.
7. Explain the influence of power factor on the regulation of a transmission line.
8. List the types of grounding and what is substation grounding?
9. List the types of grounding and what is substation grounding?
10. Classify the substations according to service.

Part-B (16 Marks)

1. Explain the different types of substation layouts and list few advantages of GIS (16)
2. Explain the neutral grounding of the following methods Solid grounding and Resistance grounding (16)
3. Describe any four methods of power system grounding (16)
4. A single core cable used on 33kV, 50Hz has conductor diameter 10mm and inner diameter of sheath 25mm. The relative permittivity of insulating material used is 3.5 Find (1) Capacitance of the cable per km (2) Maximum and minimum electrostatic stress in the cable (3) Charging current per km (16)
5. A single core cable for 66kV, 3phase system as a conductor of 2cm diameter and sheath of inside diameter 5.3cm. It is required to have two inter sheaths so that the stress varies between the same maximum and minimum values in the three layers of dielectric. Find the positions of inter sheaths, maximum and minimum stress and voltages on the inter sheaths. Also find the maximum and minimum stress if the inter sheath are not used. (16)

Course Faculty **HoD**