

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

QUESTION BANK

COURSE TITLE : HVDC TRANSMISSION

COURSE CODE : 23EE705

REGULATION : R23

S. No.	UNIT-V: Harmonics and Filters	BT	CO	PO
	Short Answer Questions			
1	What are harmonics in an HVDC transmission system?	BT1	CO5	PO1
2	How are harmonics generated in HVDC converters?	BT2	CO5	PO1
3	Define characteristic harmonics.	BT1	CO5	PO1
4	What are non-characteristic harmonics?	BT1	CO5	PO1
5	What are the adverse effects of harmonics on power systems?	BT2	CO5	PO1
6	How does pulse number affect harmonic generation?	BT2	CO5	PO2
7	What is meant by AC harmonic calculation?	BT1	CO5	PO1
8	What is the purpose of harmonic filters in HVDC systems?	BT2	CO5	PO1
9	What is a single-tuned filter?	BT1	CO5	PO1
10	What is a high-pass filter and where is it used?	BT1	CO5	PO1
	Long Answer Questions			
11	Explain the generation of harmonics in HVDC transmission systems. Discuss the role of converter operation in harmonic production.	BT4	CO5	PO2

12	Define characteristic harmonics and derive the expressions used to determine their order in HVDC converter systems.	BT4	CO5	PO2
13	Explain non-characteristic harmonics. Discuss the causes responsible for their generation in HVDC converters.	BT4	CO5	PO2
14	Discuss the adverse effects of harmonics on power system equipment, communication systems, and overall power quality.	BT4	CO5	PO2
15	Explain the procedure for calculating AC harmonics in HVDC transmission systems. Illustrate with suitable examples.	BT3	CO5	PO2
16	Derive and explain the methods used for calculating voltage and current harmonics in HVDC converter stations.	BT4	CO5	PO2
17	Discuss the effect of pulse number on harmonic generation. Compare the harmonic performance of 6-pulse and 12-pulse converters.	BT4	CO5	PO4
18	Explain the necessity of filters in HVDC systems. Classify the different types of AC filters and discuss their applications.	BT2	CO5	PO2
19	Describe the design procedure of a single-tuned AC harmonic filter. Explain the selection of filter components and tuning frequency.	BT6	CO5	PO4
20	Explain the design and operation of high-pass filters used in HVDC systems. Compare their performance with single-tuned filters and discuss their advantages and limitations.	BT4	CO5	PO4