

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2023)

CLASS: B.TECH
BRANCH: EEE

SEMESTER : VII
SESSION : MO/2023

SUBJECT: EE535 HVDC AND FACTS

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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Q.1(a)	Discuss the application of HVDC system.	[2]	1	I
Q.1(b)	Compare the HVDC transmission system with EHVAC transmission system for bulk power generation based on technical performance, economics, protection and reliability.	[3]	1	II
Q.2(a)	Explain the suitability of three phase bridge converter over other converters for HVDC system.	[2]	2	II
Q.2(b)	Draw and explain various types of DC links used in HVDC system.	[3]	1	II
Q.3(a)	Explain in brief, the difference in the operation of 180° mode of operation and 120° mode of operation of bridge converter.	[2]	2	III
Q.3(b)	Draw and explain various components of HVDC system.	[3]	1	II
Q.4(a)	Explain the harmful effects of AC side and DC side harmonics.	[2]	2	II
Q.4(b)	Draw the firing angle sequence and output waveforms for three-phase bridge controlled converter, operating in 120° mode.	[3]	2	III
Q.5(a)	Explain the reasons for the development of characteristic and non-characteristic harmonics in HVDC system.	[2]	2	II
Q.5(b)	Derive the Fourier Transform representation for the current of secondary side of star-star transformer connected in HVDC system. Also find the value of A_0 , A_n and B_n for the same.	[3]	2	IV

:::21/09/2023 M:::