PAPER ID-310255

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VII) THEORY EXAMINATION 2024-25
HVDC & AC TRANSMISSION

TIME: 3 HRS **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	CO	Level
a.	Compare the power transfer capacity of EHV AC and DC systems.	1	K2
b.	Explain the role of bundled conductors in high voltage transmission?	1	K4
c.	Discuss the impact of switching surges in EHV systems?	2	K2
d.	Explain radio interference in EHV AC systems?	2	K6
e.	Discuss the role of creepage distance in EHV line design?	3	K2
f.	Discuss the impact of pollution on the performance of EHV lines?	3	K2
g.	Define firing angle in an HVDC converter.	4	K1
h.	Name the three types of DC links used in HVDC systems.	4	K1
i.	Distinguish between AC and DC filters.	5	K4
j.	Discuss the role of smoothing reactor in HVDC system?	5	K2

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

Q no.	Question	CO	Level
a.	Describe the role of surface voltage gradient in corona formation and power loss?	1	K2
b.	Discuss the potential effects of ferro-resonance on EHV system components.	2	K2
c.	Explain why the efficiency of an impulse generator depend on its design and components?	3	K3
d.	Explain the reason behind the use of 6-pulse and 12-pulse converters in HVDC systems?	4	K5
e.	Explain the role of surge arresters in protecting HVDC systems from overvoltage.	5	K6

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

Q no.	Question	CO	Level
a.	Explain the concept of corona discharge in EHV transmission systems and its effects on system performance.	1	K2
b.	Discuss the environmental and economic impacts of UHVAC systems compared to lower-voltage systems.	1	K2

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4. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	Describe the properties of corona pulses and their effect on the performance of transmission lines.	2	K2
b.	Describe methods to reduce overvoltages caused by switching operations in EHV systems.	2	K2

5. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	Explain the principle and design of a voltage multiplier circuit for high DC voltage generation.	3	K4
b.	Explain the importance of impedance matching in potential divider system for accurate high-voltage measurement.	3	K4

6. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	Explain the role of rectifier and inverter in controlling the power flow in a DC link.	4	K6
b.	Explain the concept of overlap angle and its relation to source inductance in HVDC system.	4	K6

7. Attempt any *one* part of the following: 10 x 1 = 10

Q no.	Question	CO	Level
a.	Describe the types of MTDC systems and their configurations.	5	K2
b.	Explain the causes and effects of commutation failure in HVDC converters.	5	K2