R13

Code No: 118BR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, June - 2018
FUNDAMENTALS OF HVDC AND FACTS DEVICES
(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	What is pulse number of a converter? What is its significance?	[2]
b)	List the applications of DC transmission.	[3]
c)	What do you understand by starting of D.C. link?	[2]
d)	List various types of DC links.	[3]
e)	Define active power and reactive power.	[2]
f)	What are harmonics? What are their effects in power systems?	[3]
g)	What is a STATCOM?	[2]
h)	What are the objectives of shunt compensation?	[3]
i)	What are the applications of unified power flow controller?	[2]
j)	What are the objectives of series compensation?	[3]

PART - B

(50 Marks)

2. Make a comparison between HVAC and HVDC transmission. Also list the advantages of HVDC transmission. [10]

OR

3.a) Draw the schematic diagram and explain the operation of a twelve pulse converter.
b) Draw and explain the equivalent circuit for a 6-pulse converter. [5+5]

4. Explain in detail the equidistant pulse control (EPC) scheme for HVDC. Also list the merits and drawbacks of EPC scheme. [10]

OR

5.a) Discuss different types of converters used in HVDC stations.
b) Explain the extinction angle control of HVDC converters. [5+5]

6.a) Discuss in detail the sequential method for the solution of AC/DC load flow.
b) Explain the modeling of HVDC converters. [5+5]

OR

7.a) Explain the use of static VAR systems in HVDC transmission.
b) Explain the need for filters in HVDC transmission systems. [5+5]

8.a) What are FACTS controllers? What are its benefits?

b) What is use of reactive shunt compensation? Discuss the effect of midpoint voltage regulation of a line on power transfer capability. [4+6]

OR

9. Compare the performance of SVC and STATCOM from the point of view of transient stability improvement. [10]

10.a) Compare between shunt and series compensation.

b) Explain the working of static series synchronous compensator (SSSC). [5+5]

OR

11. What is unified power flow controller (UPFC)? Explain its principle, and operation. [10]

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