

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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