Code: R7410205

R07

B.Tech IV Year I Semester (R07) Supplementary Examinations, May 2013
HVDC TRANSMISSION
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks
*****

1   Explain in detail about the economic advantages of HVDC transmission over HVAC link for transmitting bulk powers from point to point based on insulation requirements and stability.

2   For a 3-∅, 6-pulse Graetz's circuit, draw the timing diagram considering overlap angle is less than $60°$ and without overlap for the following:
   (a) Voltage across load.
   (b) Voltage across any two pair of conducting values.

3   Explain the individual characteristics of a rectifier and an inverter with sketches.

4   With block diagram, discuss the principle of operation of a basic power controller.

5   Write short notes on the following:
   (a) Surge arrestors.
   (b) Commutation failures.

6 (a) Derive the mathematical model of DC link controller of a DC link.
   (b) Write mathematical model of a DC converter.

7   It is required to eliminate harmonics of order 10 and below 10 other than fundamental in a 12-pulse converter. Suggest a suitable transformer configuration and derive an equation for primary current of transformer.

8   Derive an equation for harmonic voltage and current for single tuned filter and discuss the influence of network admittance on design aspects.

*****