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**Reg. No. :**

**Question Paper Code: 49034**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Elective

Electrical and Electronics Engineering

14UEE913- HVDC TRANSMISSION

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 1 = 10 Marks)

1. HVDC transmission commercially began in the year

 (a) 1950 (b) 1954 (c) 1970 (d) 1935

2. In a monopolar system usually the pole is

 (a) Positive (b) Negative

 (c) Positive and Negative (d) Alternately positive and negative

3. Modern HVDC system are all

 (a) 3-pulse converters (b) 6-pulse converters

 (c) 24-pulse converters (d) 12-pulse converters

4. Short circuit ratio of an HVDC grid is

 (a) Dc power flow/ KVA

 (b) AC MVA/DC MW

 (c) Voltage/Current at the short circuit point

 (d) Short circuit MVA at converter bus rated DC power MW

5. Converter valves should be operated strictly within their \_\_\_\_\_\_\_\_\_\_\_\_Rating

 (a) Power (b) Voltage (c) Current (d) Both a and b

6. The difference between the current controller settings of the two stations is called

 (a) Current margin (b) Voltage margin (c) Constant current control (d) Tap changer

7. There are basically\_\_\_\_\_\_\_\_\_\_\_\_\_types of filters

 (a) 3 (b) 4 (c) Five (d) 2

8. The radio interference is mainly due to the ………. Conductor

 (a) Positive (b) Negative (c) Both positive and negative (d) Metallic conductor

9. The first HVDC scheme in India is

 (a) Vidhyachal back-to-back system (b) Chandrapur-padghe scheme

 (c) Delhi-Rihand 500 kV system (d) Sileru –Basoor system

10. The main advantage of HVDC-VSC scheme is

 (a) Both active and reactive power can controlled (b) Does not require DC filter

 (c)Can be used for very high power more than 1500 MW (d) all of the above

PART - B (5 x 2 = 10 Marks)

11. Draw the block diagram of bipolar link.

12. Define pulse number of a converter.

13. Justify, how power is reversed in HVDC link?

14. Recall the criteria for selection of DC filter.

15. Compare the DC and AC cables from economic point of view.

PART - C (5 x 16 = 80 Marks)

16. (a) Discuss the modern trends in DC transmission. Also describe the steps involved in

 planning the HVDC transmission system. (16)

Or

(b) With the neat schematic diagrams discuss DC transmission system in detail. (16)

17. (a) Develop the analysis of 12 pulse converter with bridge rectifier. (16)

Or

 (b) With the neat diagram and waveforms explain the 6-pulse Graetz’s circuit. (16)

18. (a) Draw the converter characteristics of a HVDC link and explain the different modes of

 operation. (16)

Or

 (b) Explain the individual phase control and equidistance pulse control schemes for firing

 angle control of HVDC link. (16)

19. (a) Derive an equation for harmonic voltage and current for single tuned filter and discuss

 the influence of network admittance on design aspects. (16)

 Or

(b) Write a short notes on

 (i) SVC (ii) STATCOM (16)

20. (a) Describe the governing equations for the dc converter and controller unit. (16)

Or

(b) With any one case study briefly explain about the ac-dc power flow analysis under dynamic conditions. (16)