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(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0289 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. VIII) THEORY EXAMINATION 2010-11

EHV AC AND DC TRANSMISSION

Time : 3 Hours *Total Marks : 100*

Note :— (1) Attempt **ALL** questions.

(2) All questions carry equal marks.

(3) Be precise in your answer.

1. Attempt any **four** parts of the following : **(4×5=20)**

(a) What are the basic needs of EHV DC Transmission in power system networks ? Also mention the limitations of EHV DC Transmission.

(b) What are the modern trends of EHV AC and DC transmission in INDIAN COUNTRY ? Explain it.

(c) Compare the EHVAC and DC transmission system and their applications. Also discuss the limitations for each system.

(d) What do you understand by "SURFACE VOLTAGE GRADIENTS IN CONDUCTOR" and "DISTRIBUTION OF VOLTAGE GRADIENTS ON SUBCONDUCTORS" ?

(e) What are the mechanical considerations of transmission lines in power system networks ? Explain in brief.

(f) What are the standard transmission voltage level in the all over INDIA ? Also discuss the standard transmission voltage level in U.S.A.

2. Attempt any **two** parts of the following : **(2×10=20)**

(a) Explain the principle of halfwave transmission in power system environments. Also discuss the advantages/ disadvantages of halfwave transmission.

(b) What do you mean by "CORONA LOSS" and "CORONA CURRENT" in EHV AC Transmission ? Write the Corona loss formulae on the basis of voltages and voltage gradients. Also discuss the merits/demerits of Corona formation in EHV AC transmissions.

(c) What do you mean by "RADIO INTERFERENCE (RI)" effect in EHV AC transmissions ? Explain the phenomena of ferroresonance in EHV AC transmissions. Also discuss the Audible Noise and its generation and characteristics in EHV AC transmissions.

3. Attempt any **two** parts of the following : **(2×10=20)**

(a) Discuss the different methods for generation of high AC and DC voltages.

(b) Explain the measurement of high voltage by sphere gaps and potential dividers. Also discuss the advantages/ disadvantages of sphere gaps method over potential dividers methods.

(c) Discuss the different methods for generation of impulse voltage. Define "TAIL TIME" and "FRONT TIME" in impulse voltage waveforms. Also discuss the limitations and characteristics of impulse voltages.

4. Attempt any **two** parts of the following : **(2×10=20)**

(a) Discuss the types of D.C. link in power system environments with help of neat diagram. Also mention its advantages/disadvantages and applications.

(b) Consider the structure of power-system network shown in Fig. 1.

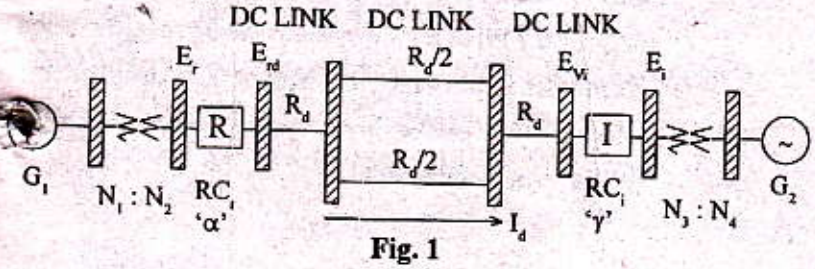

Fig. 1

(i) Draw the single line diagram of Fig. 1.

(ii) Determine the value of DC link current (I_d) by using superposition principle based on linearity and homogeneity principle.

(iii) Also verify your results in part (b) by conventional method such as Kirchhoff Voltage Law (KVL).

(c) Discuss the converter controls characteristics. Explain the following :

(i) FIRING ANGLE CONTROL

(ii) CURRENT AND EXTINCTION ANGLE CONTROL

(iii) POWER CONTROL.

5. Attempt any **two** parts of the following : **(2×10=20)**

(a) Write a short notes on the following :

(i) MULTI-TERMINAL DC SYSTEMS (MTDC)

(ii) SMOOTHING REACTORS.

(b) What do you mean by "AC FILTERS" and "DC FILTERS" ? What are the advantages/disadvantages of AC filters over DC filters ? Also mention the significances of AC filters and DC filters.

(c) What do you understand by "CURRENT HARMONICS" and "VOLTAGE HARMONICS" in power system networks ? What are the various causes of generation of harmonics in power system networks ? Also mention its adverse effect on the power system components used in power system networks.