B.E. (Electrical Engineering (Electronics & Power)) Eighth Semester (C.B.S.)

Elective - II: EHVAC & HVDC Transmission System

	ages : e : Thr	ee Hours	* 0 8 4 4 *	TKN/KS/16/7659 Max. Marks : 80		
	Note	 Solve Question 1 OR Question 3 OR Question 3 OR Question 5 OR Question 5 OR Question 7 OR Question 7 OR Question 9 OR Question 9 OR Question 11 OR Question 11 OR Question 2 Output 1 OR Question 2 OR Question 2 OR Question 2 OR Question 2 OR Question 3 OR Question 5 OR Question 5 OR Question 7 OR Question 9 OR Question 1 OR	estions No. 2. estions No. 4. estions No. 6. estions No. 8. estions No. 10. destions No. 12. do neatness and adequate necessary. denever necessary we	ith the help of neat sketches.		
1.	a)	Prove that parentage power loss in	AC transmission lin	ne is independent of its length.		
	b)	A power of 2150 MW is to be transation 400kv and 750 kv. line reactance a Line Resistance Ω/k Line Reactance Ω/k Assume $\delta = 30^{\circ}$ and series compensity. No of ckt ii) Total powers	nd resistance are as 400 kv 75 m 0.031 0.0 m 0.327 0.2	follow. 0 kv 0136 272 eest		
2	a)	Derive the expression for electric field of a line charge of Two-conductor AC line considering the effect of ground.				
	b)	A single circuit transmission line is placed above ground to study the High voltage effect. The conductors are ASCR with diameter 0.0635m and separated by a distance of 6m. The line height is 21m above ground. i) Find Maxwell's potential coefficient. ii) Find Charge coefficient of voltage are ± 400kv. iii) Check weather corona take place on the surface.				
3.	a)	What is critical disruptive voltage?	Discuss the factors	affecting corona power loss. 7		
	b)	Find the critical disruptive voltage and critical voltage for local and general corona on a 66kv, 3 \$\phi\$ overhead line consisting of three stranded copper of an equilateral triangle. Air temperature and pressure are 21°C & 73.6 cm of Hg respectively. The conductor diameter is 10.4mm.				
4.	a)	What is the effect of high electrost		beings, animal and plants.		
	b)	Explain charge-voltage diagram with corona.				
5.	a)	Compare EHVAC and HVDC tran i) Bulk power transmission. iii) Skin effect.	ii) Line co	espect to. empensation. transfer and reactive power.		

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	b)	State the factors to be considered in selecting a site of earth electrode. OR	5	
6.	a)	Discuss the advantages of higher pulse number HVDC converter. Draw the arrangements for twelve pulse bridge converter.		
	b)	State the different kind of HVDC links along with their advantages, disadvantages and application.		
7.	a)	Explain the combined CEA and CC control used in Converter.		
	b)	A bridge connected rectifier is fed from 220kv/110kv transformer with primary connected to 220kv. Determine the d. c. output voltage when commutation angle is 15° and the delay angle. a) 0° b) 30° and c) 45°		
		OR		
8.	a)	Draw and explain the complete characteristics of a converter.	7	
	b)	A d. c. link has loop resistance of 5Ω and is connected to a transformer giving secondary voltage of $110v$ at each end. The bridge connected converter operates as follow. Rectifier $\rightarrow \alpha = 15^{\circ}$, $x = 15\Omega$ Inverter $\rightarrow \delta o = 10^{\circ}$ $r = 15^{\circ}$, $x = 15\Omega$ Allow 5° margin on δo and δ . Calculate the direct current delivered if the inverter operates on constant ignition angle control.	7	
9.	a)	Give a single line schematic diagram of A. C. Harmonics filters in a typical HVDC substation. State the order of harmonics of the filter branches.		
	b)	Write a short notes on i) Shunt filters ii) Series filters. OR	6	
10.	a)	Derive an expression for the reactive power requirement of HVDC converts. How these requirement are met.	7	
	b)	Explain in short. i) Single frequency tuned filter. ii) Double frequency tuned filter.	6	
11.	a)	How the commutation principle is used for HVDC circuit breaker, Explain.	7	
	b)	Describe the function of MRTB and its switching sequence. OR	6	
12.	a)	Compare the protection philosophy of EHVAC and HVDC transmission.	7	
	b)	Write a short notes oni) Insulation co-ordination of HVDC system.ii) Fault clearing in HVDC system.	6	
