



Sub: EPTS
Time: 1½ Hrs.

Date:08-11-2017
Max Marks: 30M

NOTE: Question 1 is compulsory. Answer one from 2 or 3, one from 4 or 5.

s.no	Question	Marks	Unit	CO	Cognitive level
1.a	Define the term sag template.	2M	3	C302.5	Remember
1.b	Define the corona.	2M	3	C302.4	Remember
1.c	List out different types of transients in a power systems.	2M	4	C302.3	Remember
1.d	An over head line has a surge impedance of 400 Ω and is terminated with the load which has the Impedance of 50 Ω . Find the Refracted coefficient and Reflected coefficients for current wave.	2M	4	C302.6	Remember & Apply
1.e	What is meant by grading? List out the types of grading.	2M	5	C302.6	Remember
2.a	Can you explain the causes of Failure of insulators?	4M	3	C302.4	understanding
2.b	A 3-phase overhead transmission being supported by 3-disc insulators. The potentials across top unit and middle unit are 8KV & 11KV respectively. Calculate (a) The ratio of capacitance between pin and earth to the self-capacitance of each unit (b) The line voltage.	6M	3	C302.4	Apply
3..	Evaluate the mathematical expression for Critical disruptive and Critical Visual voltages.	10M	3	C302.4	Evaluate
4.	Discuss the phenomenon of reflection and refraction in travelling wave. Evaluate the expressions for reflection and refraction coefficients when a travelling wave is terminated through a Resistance.	10M	4	C302.3	Analyze
5.	What is necessity of grading of cables? And explain briefly the various grading methods of cables.	10M	5	C302.6	Understanding

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S.No	Question	Marks	Unit	CO	Cognitive level
1.a	List out the factors affecting the corona.	2M	3	C302.4	Remember
1.b	What do you mean The Radio interference?	2M	3	C302.4	Understand
1.c	Define the Attenuation and Distortion.	2M	4	C302.3	Understand
1.d	List out the advantages and disadvantages of intersheath grading.	2M	5	C302.6	Remember
1.e	List out different types of underground cables.	2M	5	C302.6	Remember
2.	A 3-phase, 220KV, 50Hz Transmission line consists of 30mm diameter conductor spaced 2.5m apart in the form of an equilateral triangle. In the temperature is 38°C and atmosphere pressure is 76cm. Calculate the corona loss per km of the line. Assume the irregularity factor as 0.83.	10M	3	C302.4	Apply
3.	Deduce the mathematical expression for the sag and tension of the conductor at equal and unequal levels of the towers.	10M	3	C302.5	Evaluate
4.	Evaluate the mathematical expressions for voltage and current of the travelling waves if the line is terminated by series reactance.	10M	4	C302.6	Evaluate
5.	A single core lead sheath cable is graded by using three dielectrics of relative permittivity 5, 4 & 3 respectively. The conductor diameter is 2 cm and overall diameter is 8 cm. If the three dielectrics are worked at the same maximum stress of 40 Kv/cm. Find the safe working voltage of the cable. What will be the value of safe working voltage for an ungraded cable, assuming the same conductor and overall diameter and the maximum dielectric?	10M	5	C302.6	Apply

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1.a	Can you explain why the voltage across the insulator string is not constant.	2M	3	C302.4	Understand
1.b	List out advantages and disadvantages of corona.	2M	3	C302.4	Remember
1.c	List out different types of Transients.	2M	4	C302.3	Remember
1.d	What are the coefficients of refraction of voltage and current wave? If the line is terminated with Open circuit.	2M	4	C302.3	Understand
1.e	List out any four point about difference between overhead transmission line and underground cables.	2M	5	C302.6	Remember
2.	The towers of height 30m and 90m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500m. If the tension in the conductor is 1600kg. Find the minimum clearance of the conductor and water and clearance mid-way between the supports. Weight of the conductor is 1.5kg/m. Bases of the towers can be considered to be at water level.	10M	3	C302.5	Apply
3.	Enumerate the following terms. (a) The theory of Corona formation. (b) String chart.	10M	3	C302.4	Analyze
4.	Explain how the travelling waves get attenuation and distortion with mathematical expression.	10M	4	C302.3	Understand
5.a	Describe with a neat sketch, the construction of a single core cable.	5M	5	C302.6	Understand
5.b	Proof the Most economical size of the conductor in a cable is $d=D/2.718$.	5M	5	C302.6	Analyze

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Branch: EEE

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NOTE: Question 1 is compulsory. Answer one from 2 or 3, one from 4 or 5.

	Question	Marks	Unit	CO	Cognitive level
1.a	Define Sag and What factors affect the sag?	2M	3	C302.5	Remember
1.b	Define the corona?	2M	3	C302.4	Remember
1.c	What are the coefficients of reflection of voltage and current wave? If the line is terminated with Short circuit	2M	4	C302.3	Understand
1.d	List out different types of transients in a power systems.	2M	4	C302.3	Remember
1.e	Determine the insulation resistance of a single core cable of length 3km and having conductor radius 12.5 mm, insulation thickness 10mm and specific resistance of insulation of 5×10^{12} ohm/m.	2M	5	C302.6	Apply
2.	A transmission has a span of 275m between level supports. The conductor has an effective diameter of 1.96 cm and weight 0.865kg/m. Its ultimate strength is 8060 kg. If the conductor has ice coating of radial thickness 1.27cm and is subjected to a wind pressure of 3.9 gm/cm ² of projected area. Calculate sag for a safety factor of 2. Weight of 1 c.c of ice is 0.91 gm.	10M	3	C302.5	Apply
3.	Deduce the mathematical expression for string efficiency of overhead line insulators.	10M	3	C302.4	Evaluate
4.	Starting from fundamental proof the velocity of the traveling wave is equal to the light velocity and also find the surge impedance of the line.	10M	4	C302.3	Analyze
5.	A single core 66 KV cable working on 3-phase system has a conductor diameter of 2 cm and a sheath of inside diameter 5.3 cm. If two intersheaths are introduced in such a way that the stress varies between the same minimum and maximum in the three layers. Find (a) Positions of intersheaths. (b) Voltage on the intersheath (c) Maximum and minimum stress.	10M	5	C302.6	Apply

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