Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec – 2018**

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| **Code : 14EE2013** |  | **Duration :** | **3hrs** |
| **Sub. Name : TRANSMISSION AND DISTRIBUTION** |  | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Discuss and clearly frame equations for the advantages of AC transmission over DC transmission. | CO1 | 10 |
| b. | Sketch a typical Alternating Power Supply System and mark the voltage levels from generation, through transmission up to distribution systems. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | A generating station has a maximum demand of 25MW, a load factor of 60%, a plant capacity factor of 50% and a plant use factor of 72%. Find i) the reserve capacity of the plant ii) the daily energy produced iii).maximum energy that could be produced daily if the plant while running as per schedule, were fully loaded. | CO1 | 10 |
| b. | Derive an expression for Single phase four wire system. | CO1 | 10 |
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| 3. | a. | Find the inductance per km of a 3-phase transmission line using 1·24 cm diameter conductors when these are placed at the corners of an equilateral triangle of each side 2 m. | CO2 | 5 |
| b. | With the help of a neat diagram explain the concept of self GMD and mutual GMD for evaluating the inductance of transmission lines. | CO2 | 15 |
| (OR) | | | | |
| 4. | a. | A 3-phase, 50Hz transmission line 100 km long delivers 20 MW at 0.9 pf lagging and at 110 kV. The resistance and reactance of the line per phase per km are 0.2 ohm and 0.4 ohm respectively, while capacitance admittance is 2.5 x 10-6siemen / km/ ph. i) Calculate the current voltage at the sending end. ii) Efficiency of transmission. Use nominal T method. | CO2 | 15 |
| b. | Deduce an expression for voltage regulation of a short transmission line, giving the vector diagram. | CO2 | 5 |
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| 5. | a. | A three-phase overhead transmission line uses three suspension type insulators. The voltage across the top unit is 8.5 kV and across the middle unit is 10 kV. Calculate i) ratio of shunt to self-capacitance ii) String efficiency iii) line voltage. | CO2 | 10 |
| b. | Explain suspension type insulators. Give reasons for unequal potential distribution over a string of suspension insulators. Show that in a string of suspension insulators, the disc nearest to the conductor has the highest voltage across it. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Deduce an expression for sag in overhead lines when i. Supports are at equal levels. ii. Supports are at unequal levels | CO2 | 15 |
| b. | What is corona loss? What are the factors affecting corona loss? How is it reduced? | CO2 | 5 |
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| 7. | a. | 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 inter sheaths are introduced in such a way that the stress varies between the same maximum and minimum in the three layers, find: i.positions of inter sheaths ii.voltage on the inter sheaths iii.maximum and minimum stress. | CO2 | 10 |
| b. | Prove that gmax/gmin in a single core cable is equal to D/d where D is the internal sheath diameter and d is the core diameter. | CO2 | 10 |
| (OR) | | | | |
| 8. | a. | With the help of a neat diagram explain the constructional details of a single core low tension cable. | CO2 | 10 |
| b. | A single core lead sheathed cable is graded by using three dielectrics of relative permittivity 5, 4 and 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. | CO2 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Derive an expression for AC distribution with respect to power factor referred to receiving end voltages. | CO3 | 5 |
| b. | Describe any three types of dc distributors and derive the expression for the same. | CO3 | 15 |