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



**End Semester Examination – Nov / Dec – 2019**

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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. | The daily demands of three consumers are given below:   |  |  |  |  | | --- | --- | --- | --- | | Time | Consumer 1 | Consumer 2 | Consumer 3 | | 12 midnight to 8 A.M | No Load | 200W | No load | | 8 A.M to 2 P.M | 600 W | No Load | 200 W | | 2 P.M to 4 P.M | 200W | 1000 W | 1200 W | | 4 P.M to 10 P.M | 800 W | No Load | No Load | | 10 P.M to midnight | No Load | 200 W |  |   Plot the load curve and find i) maximum demand of individual consumer ii) load factor of individual consumer iii) diversity factor  iv) load factor of the station . | CO1 | 10 |
| b. | Derive an expression for two phase four wire system. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Discuss about the merits and demerits of Alternating current transmission systems over direct current transmission sytems. | CO1 | 10 |
| b. | A diesel station supplies the following loads to various consumers :Industrial consumer = 1500 kW ; Commercial establishment = 750 kW; Domestic power = 100 kW; Domestic light = 450 kWIf the maximum demand on the station is 2500 kW and the number of kWh generated per year is45 × 105, determine:  (i) the diversity factor (ii) annual load factor. | CO1 | 10 |
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| 3. | a. | Explain the concept of self GMD and mutual GMD for evaluating the inductance of transmission lines. | CO2 | 10 |
| b. | Derive an expression for electric potential (i) at a charged single conductor (ii) at a conductor in a group of charged conductors. | CO2 | 10 |
| **(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. a. Calculate the current and voltage at the sending end. b. Efficiency of transmission. Use nominal π method | CO2 | 10 |
|  | b. | Show how regulation and transmission efficiency are determined for medium lines using nominal T method. | CO2 | 10 |
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| 5. | a. | A 3-phase overhead transmission line is supported on 4-disc suspension insulators. The voltage acrossthe second and third discs are 13·2 kV and 18 kV respectively. Calculate the line voltage and mentionthe nearest standard voltage. | CO2 | 10 |
| b. | What is corono loss? Discuss the factors which are affecting corona. | CO2 | 10 |
| **(OR)** | | | | |
| 6. | a. | A transmission line has a span of 150 m between level supports. The conductor has a cross-sectional area of 2 cm2. The tension in the conductor is 2000 kg. If the specific gravity of the conductor material is 9·9 gm/cm3 and wind pressure is 1·5 kg/m length, calculate the sag. What is the vertical sag? | CO2 | 10 |
| b. | Compare the merits and demerits of underground system versus overhead system. | CO2 | 10 |
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| 7. | a. | Draw a cross sectional view, showing the constructional details of a single core low tension cable and explain the purpose of each material used. | CO2 | 10 |
| b. | A single core cable for use on 11 kV, 50 Hz system has conductor area of 0.645cm2 and internal diameter of sheath is 2.18 cm. The permittivity of the dielectric used in the cable is 3.5. Find:  (i) the maximum electrostatic stress in the cable  (ii) minimum electrostatic stress in the cable  (iii) capacitance of the cable per km length  (iv) charging current. | CO2 | 10 |
| **(OR)** | | | | |
| 8. | a. | The maximum and minimum stresses in the dielectric of a single core cable are 40 kV/cm (r.m.s.) and 10 kV/cm (r.m.s.) respectively. If the conductor diameter is 2 cm, find:  (i) thickness of insulation (ii) operating voltage. | 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 |
|  | | **Compulsory**: |  |  |
| 9. | a. | With neat diagrams, explain the following distribution systems.  i) Radial system ii) Ring main system iii) Interconnected system. | CO3 | 10 |
| b. | Describe any three types of dc distributors and derive the expression for the same. | CO3 | 10 |