**Code No.PC404EE**

**METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY**

**(An Autonomous Institution)**

**B.E. (EEE) IV-Semester (AICTE) Regular Examination, AUGUST-2023**

**Subject: POWER SYSTEMS-I**

**Time: 3 hours Max.Marks:60**

**Note: Missing data, if any, maybe suitably assumed.**

**PART-A**

**Answer All the questions.(10X2M=20M)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q.No.** | **Questions** | **Marks** | **CO** | **BTL** |
| **1. a** | **Why is the overall efficiency of a steam power station very low?** | **2M** | **1** | **2** |
| **b** | **What is the function of economizer?** | **2M** | **1** | **2** |
| **c** | **What are the advantages of non-conventional energy sources?** | **2M** | **2** | **1** |
| **d** | **List the properties of control rods in nuclear power plant?** | **2M** | **2** | **2** |
| **e** | **Define Load Factor and Diversity Factor?** | **2M** | **3** | **1** |
| **f** | **List the advantages of ring main system?** | **2M** | **3** | **1** |
| **g** | **What do you understand by GMR and GMD of a transmission line?** | **2M** | **4** | **2** |
| **h** | **List out the advantages of bundled conductors?** | **2M** | **4** | **1** |
| **i** | **What are the methods to improve the string efficiency?** | **2M** | **5** | **2** |
| **j** | **What is the need of grading the cables?** | **2M** | **5** | **2** |

**PART-B**

**Answer Any Five questions**.**(5X8M=40M)**

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| --- | --- | --- | --- | --- | --- |
| **Q.No.** |  | **Questions** | **Marks** | **CO** | **BTL** |
| **2.** |  | **Explain with neat diagram various parts & its functions in thermal power plant?** | **8M** | **1** | **L2** |
| **3.** | **a** | **What are the various criteria for selection of a nuclear power plant?** | **4M** | **2** | **L2** |
| **b** | **What is the function of solar concentrators? Describe various components of a solar concentrator and discuss its advantages?** | **4M** | **2** | **L2** |
|  |  |  |  |  |  |
| **4.** |  | **A 2-wire D.C. Street mains AB, 600 m long is fed from both ends at 220 V, loads of 20A, 40A, 50A and 30A are supplied at distance of 100m, 250m, 400m, 500m from the end A respectively. If the area of cross section of distributor is 1 cm2. Find the minimum consumer voltage. Take ρ = 1.7 10-6 Ω-cm.**  220 V  220 V  20 A  40 A  50 A  30 A  100 m  100 m  150 m  150 m  100 m  IA  IB | **8M** | **3** | **L4** |
| **5.** | **a** | **Determine the inductance per km of a 3-phase transmission line using 20 mm diameter conductors when conductors are situated at the corners of a triangle with spacing of 4m, 5m and 6m. Conductors are regularly transposed?** | **5M** | **4** | **L4** |
| **b** | **Derive an expression for the capacitance of a single-phase overhead transmission line?** | **3M** | **4** | **L3** |
| **6.** | **a** | **A transmission line has a span of 150 m between level supports. The conductors have a cross sectional area of 2 cm2. The tension in the conductor is 2500 kg. If the specific gravity of the conductor material is 9 gm/cm3 and wind pressure is 0.87 Kg/m length. Calculate the sag?** | **5M** | **5** | **L3** |
| **b** | **Why potential distribution over a string of suspension insulators is not uniform?** | **3M** | **5** | **L2** |
| **7.** | **a** | **What are the considerations have to be kept in view of selecting hydel power plant?** | **4M** | **1** | **L2** |
| **b** | **Explain the working of nuclear power station with neat diagram?** | **4M** | **2** | **L2** |
| **8.** | **a** | **Derive the expression for most economical power factor when demand is constant?** | **4M** | **3** | **L3** |
| **b** | **Derive the expression for inductance of an unsymmetrical transposed 3-phase transmission line?** | **4M** | **4** | **L3** |
| **9.** | **a** | **What are the methods of equalizing the potential distribution over a string of insulators?** | **4M** | **5** | **L3** |
| **b** | **Explain the different characteristics of Wind Power?** | **4M** | **2** | **L2** |

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