**20EE702/PE**

**Hall Ticket Number:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | | |
| **January, 2024** | | **Electrical & Electronics Engineering** | | |
| **Seventh Semester** | **High Voltage Engineering** | | | |
| **Time:** Three Hours | | | **Maximum:** 70 Marks | |
| ***Answer question 1 compulsory.*** | | | | **(14X1 = 14Marks)** |
| ***Answer one question from each unit.*** | | | | **(4X14=56 Marks)** |
|  | | | |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | CO | BL | M |
| 1 | a) | Define uniform and non-uniform electric field. | CO1 | L1 | 1M |
|  | b) | What is Townsend’s first ionization coefficient. | CO1 | L1 | 1M |
|  | c) | State Paschen’s law. | CO1 | L1 | 1M |
|  | d) | What is Tesla coil? | CO2 | L1 | 1M |
|  | e) | Define wave front time and wave tail time. | CO2 | L1 | 1M |
|  | f) | What is resonant transformer? | CO2 | L1 | 1M |
|  | g) | Mention the limitations of generating voltmeter. | CO3 | L1 | 1M |
|  | h) | What are the factors that influence the spark over voltages of sphere gaps? | CO3 | L1 | 1M |
|  | i) | Define dielectric constant. | CO3 | L1 | 1M |
|  | j) | What is Flash over voltage? | CO4 | L1 | 1M |
|  | k) | Define disruptive discharge voltage. | CO4 | L1 | 1M |
|  | l) | What is the significance of thermal test on bushings? | CO4 | L1 | 1M |
|  | m) | What are the practical characteristics of a surge diverter? | CO3 | L1 | 1M |
|  | n) | Define ripple voltage. | CO2 | L1 | 1M |
| **Unit-I** | | | | | |
| 2 | a) | What is Ionization process? Explain different ionization process in detail. | CO1 | L2 | 7M |
|  | b) | Explain the streamer theory of breakdown in gases. | CO1 | L2 | 7M |
| **(OR)** | | | | | |
| 3 | a) | Explain different theories of breakdown in commercial liquids. | CO1 | L2 | 7M |
|  | b) | Explain thermal breakdown in solid dielectrics and its significance. | CO1 | L2 | 7M |
| **Unit-II** | | | | | |
| 4 | a) | Describe with a neat sketch the working of a Van de Graaff generator. What are the factors that limit the maximum voltage obtained? | CO2 | L2 | 7M |
|  | b) | Explain the Cascading transformers for generating high AC Voltages with a neat sketch. | CO2 | L2 | 7M |
| **(OR)** | | | | | |
| 5 | a) | Explain the Marx circuit of producing impulse voltages. | CO2 | L2 | 7M |
|  | b) | Explain about tripping and control of impulse generators. | CO2 | L2 | 7M |
| **Unit-III** | | | | | |
| 6 | a) | Explain the different methods of high A.C voltage measurements with their relative merits and demerits. | CO3 | L2 | 7M |
|  | b) | Explain how a sphere gap can be used to measure the peak value of voltages, and illustrate it with a neat sketch. | CO3 | L2 | 7M |
| **(OR)** | | | | | |
| 7 | a) | Explain the construction and principle operation of Rogowski coil for measurements of impulse currents. | CO3 | L2 | 7M |
|  | b) | Explain the operation of surge diverter with neat sketch. | CO3 | L3 | 7M |
| **Unit-IV** | | | | | |
| 8 | a) | Explain the different electrical tests done on circuit breakers. | CO4 | L2 | 7M |
|  | b) | Explain the different electrical tests done on transformers. | CO4 | L2 | 7M |
| **(OR)** | | | | | |
| 9 | a) | Explain the different electrical tests done on insulators. | CO4 | L2 | 7M |
|  | b) | What are the various safety precautions in H. V. Labs. | CO4 | L2 | 7M |

