**18EED23**

**Hall Ticket Number:**

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

|  |  |  |  |
| --- | --- | --- | --- |
| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **December, 2021** | **Electrical and Electronics Engineering** | | |
| **Seventh Semester** | **Switching Mode Power Suply** | | |
| **Time:** Three Hours | | **Maximum:** 50 Marks | |
| *Answer Question No.1 compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer ONE question from each unit.* | | | (4X10=40 Marks) |
|  | | |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. | a) | List the capacitors employed for power electronic applications. | CO1 L1 |  |
|  | b) | Write the design requirements of inductor. | CO1 L1 |  |
|  | c) | What are the reactive elements used in power electronic systems? | CO1 L1 |  |
|  | d) | Write the line to output transfer function of buck converter. | CO2 L2 |  |
|  | e) | Draw the equivalent circuit of small signal model of Buck converter. | CO2 L2 |  |
|  | f) | Write the Specifications for Regulator design. | CO2 L1 |  |
|  | g) | What is the function of controller in automatic control system. | CO3 L1 |  |
|  | h) | Compare multi and load resonant converters. | CO3 L1 |  |
|  | i) | Define loss free resistor (LFR). | CO4 L2 |  |
|  | j) | Write the properties of an ideal rectifier. | CO4 L2 |  |
| **Unit -I** | | | | |  | | | | | **Unit - I** |
| 2. | a) | Explain the design steps for input filter. | CO1 L1 | **5M** |
|  | b) | Write the design procedure for Capacitor. | CO1 L1 | **5M** |
| **(OR)** | | | | |  | **(OR)** |  |  |
| 3. | a) | Explain the design of inductor. | CO1 L1 | **5M** |
|  | b) | Explain the basic concepts of second order Switched Mode power converters. | CO1 L1 | **5M** |
| **Unit –II** | | | | |  | | | | | **Unit - II** |
| 4. | a) | Derive the Control to output voltage transfer function of Buck converter. | CO2 L2 | **5M** |
|  | b) | Design a feed compensator for boost converter. | CO2 L2 | **5M** |
| **(OR)** | | | | |  | **(OR)** |  |  |
| 5. | a) | Derive the transfer function of the lead compensator and draw the phase and magnitude plots. | CO2 L3 | **5M** |
|  | b) | Explain current programmed control for Switched Mode power converters. | CO2 L1 | **5M** |
| **Unit –III** | | | | |  | | | | | **Unit - III** |
| 6. | a) | Explain the Multi resonant converters. | CO3 L2 | **5M** |
|  | b) | Explain the ZVS resonant switch converter. | CO3 L2 | **5M** |
| **(OR)** | | | | |  | **(OR)** |  |  |
| 7. | a) | Explain the shunt load resonant DC-DC converter. | CO3 L2 | **5M** |
|  | b) | Compare ZCS and ZVS switching converters. | CO3 L2 | **5M** |
| **Unit –IV** | | | | |  | | | | | **Unit - IV** |
| 8. | a) | Explain the design of single phase converter systems incorporating ideal rectifier. | CO4 L1 | **5M** |
|  | b) | Draw and explain the realization of near ideal rectifier. | CO4 L1 | **5M** |
| **(OR)** | | | | |  | **(OR)** |  |  |
| 9. | a) | Explain the nonlinear phenomena in swithcing mode power converters. | CO4 L1 | **5M** |
|  | b) | Explain the average current control of buck converter. | CO4 L1 | **5M** |

****