**18EED23**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | | | | | | | | |
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| **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) | | | | |
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|  |  |  |  | | | | CO | BL | M |
|  | 1 | a) | List the capacitors employed for power electronic applications. | | | | CO1 | L1 | 1M |
|  |  | b) | Write the design requirements of inductor. | | | | CO1 | L1 | 1M |
|  |  | c) | What are the reactive elements used in power electronic systems? | | | | CO1 | L1 | 1M |
|  |  | d) | Write the line to output transfer function of buck converter. | | | | CO2 | L2 | 1M |
|  |  | e) | Draw the equivalent circuit of small signal model of Buck converter. | | | | CO2 | L2 | 1M |
|  |  | f) | Write the Specifications for Regulator design. | | | | CO2 | L1 | 1M |
|  |  | g) | What is the function of controller in automatic control system? | | | | CO3 | L1 | 1M |
|  |  | h) | Compare multi and load resonant converters. | | | | CO3 | L2 | 1M |
|  |  | i) | Define loss free resistor (LFR). | | | | CO3 | L1 | 1M |
|  |  | j) | Write the properties of an ideal rectifier. | | | | CO4 | L2 | 1M |
|  | **Unit-I** | | | | | | | | |
|  | 2 | a) | Explain the design steps for input filter. | | | | CO1 | L2 | 5M |
|  |  | b) | Write the design procedure for Capacitor. | | | | CO1 | L1 | 5M |
|  |  |  | **(OR)** | | | |  |  |  |
|  | 3 | a) | Explain the design of inductor. | | | | CO1 | L2 | 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 | L3 | 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 | L2 | 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 | L2 | 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 | L2 | 5M |

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