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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **14EE2035** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SWITCHED MODE POWER SUPPLIES** | **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. | Discuss the operation of polarity inverting boost regulator with necessary diagram and waveforms. | CO1 | 15 |
| b. | State the necessity of electrical isolation and methods used in converter circuits. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Compare and contrast a linear power supply with switched mode power supply. | CO1 | 10 |
| b. | The buck-boost circuit has the following parameters: Vs = 24V, D = 0.4, R = 5ohms, L = 20μH, C = 80μF and f = 100kHz. Determine the output voltage, inductor current average, maximum & minimum values and the output voltage ripple. | CO1 | 10 |
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| 3. | a. | Explain the operation Full bridge converter with necessary diagram and waveforms. | CO1 | 15 |
| b. | Outline the schemes to combat flux imbalance in Push-pull converter. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | A push-pull converter has the following parameters: Vs= 40V, NP/NS = 2, D = 0.4, Lx = 0.5 mH, R = 5Ω, C = 60μF and f = 20kHZ. Determine Vo, the maximum and minimum values of iLx, and the output ripple voltage. Assume all components are ideal. | CO2 | 10 |
| b. | Elucidate the working of Push-pull converter with neat diagram and waveforms. | CO2 | 10 |
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| 5. |  | Discuss the operation of flyback converter in DCM and CCM with necessary diagrams and waveforms. | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Compare Power MOSFET and Power BJT. | CO2 | 10 |
| b. | Analyze the turn-off losses of a Transistor without snubber. | CO2 | 10 |
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| 7. |  | Design a 5V, 10A Power Supply with the following specifications using IC TL494: Vin = 32V, Vout = 5V, Iout = 10A, fS = 20kHz, Ripple voltage = 20mV, Ripple current = 1.5A. | CO3 | 20 |
| (OR) | | | | |
| 8. | a. | Explain the steps of designing a transformer based on various parameters. | CO3 | 15 |
| b. | Why ferrite core transformer is preferred for regulators? | CO2 | 5 |
|  | | **Compulsory**: |  |  |
| 9. |  | Describe the basics of Resonant converter and the working principle of forward resonant converter with necessary diagrams. | CO3 | 20 |