

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



# Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)  
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

## End Semester Examination – Nov/Dec – 2016

Code : **14EE2035**  
Sub. Name : **Switched Mode Power Supplies**

Semester : **2016-17 ODD**  
Duration : **3hrs**  
Max. marks : **100**

### ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Compare and contrast a linear regulator with switched mode regulator.	CO1	8
	b.	Elaborate how the boost converter is ensured to operate in discontinuous conduction.	CO1	12
(OR)				
2.	a.	Discuss about the steps involved to design a Push Pull regulator.	CO1	14
	b.	What are the reasons for flux imbalance and its indications in push pull regulator?	CO2	06
3.		Design a full-bridge converter with the following specification: $V_o = 5V$ , $P_{o(max)} = 50W$ , $I_{o(max)} = 10A$ , $I_{o(min)} = 1A$ , $V_{dc(max)} = 60V$ , $V_{dc(min)} = 38V$ , switching frequency = 50kHz.	CO1	20
(OR)				
4.		Explain the working of a Half bridge converter topology. Write the design formula for output voltage, Output current, inductor, capacitor and output power.	CO1	20
5.		Design a 5V, 10A Power supply with the following specifications using IC TL494: Input Voltage = 32V, Output Voltage = 5V, Output Current = 10A, Switching frequency = 20kHz, Ripple voltage = 20mV, Ripple current = 1.5A.	CO2	20
(OR)				
6.	a.	Explain how a power IGBT is selected based on its switching characteristics.	CO2	10
	b.	Analyze the turnoff loss of a transistor with snubber and without snubber circuit.	CO3	10
7.	a.	Explain the steps of a designing a transformer for a push-pull converter based on core and bobbin area ( $A_e, A_b$ ), current density, frequency and peak flux density.	CO2	14
	b.	Why ferrite core transformer is preferred for regulators?	CO2	06
(OR)				
8.		Explain the working of Current Mode Control circuitry. Compare the properties of Voltage fed regulator topologies with current fed regulator topologies.	CO1, CO2	20
<b><u>Compulsory:</u></b>				
9.		Discuss in detail about the IC LT1170 buck regulator (low input voltage regulator) used for laptop and portable electronics.	CO2, CO3	20

ALL THE BEST