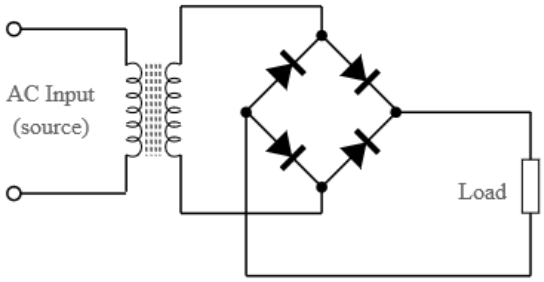
Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, Dec 2019

Programme Name: M.TECH A&RE **Semester: I**
Course Name: Electronics System Design. **Time: 03 hrs**
Course Code: ECEG 7001 **Max. Marks: 100**
Nos. of page(s): 2

S. No.	**SECTION A : Attempt all the questions**	**Marks**	**CO**
Q 1	Explain the term Electromagnetic induction? Derive the EMF equation for single phase transformer?	**7**	**CO1**
Q 2	Define the latching and holding current for SCR and given some applications of SCR?	**8**	**CO1,CO2**
Q 3	What are PCBs and describe the steps to design the circuits on PCB?	**7**	**CO2, CO1**
Q4	Why do we prefer digital communication over analog communication? Describe dual slope A/D converters?	**8**	**CO2, CO3**
	SECTION B : Attempt all the questions		
Q 5	Design a chebyshev low pass filter with maximum gain of 10 dB, with pass band ripple of 0.7 dB and cut off frequency of 5000 rad/s. The stop band frequency of the filter is 15000 rad /sec with stop band attenuation of 20 dB?	**15**	**CO1, CO2**
Q6	(a) Describe the Sample and Hold circuits and microprocessor compatible A/D converters? (b) What are Multiplying A/D converters?	**15**	**C03,CO4**
Q7	Design a constant DC power supply using IC7905 to obtain the output node at 3.0 V and 2 mA current . Mention the applications of Voltage regulators ICs in robotics?	**15**	**CO2, CO4**
	SECTION-C : Attempt all question		
Q8	Consider a AC-DC coverter steps down volatge through transformer and supplies the load through the bridge rectifier as shown in given fig. below. Design a 60Hz power transformer of the specifications: primary voltage V1 = 150 V, 60 Hz (sin wave), secondary voltage Vo = 50V, and secondary current Io = 6.5 A, Assume transformer η = 98%, and window factor Ku = 0.5. Also calculate primary and secondary copper losses.	**25**	**CO4,CO3**



Full wave rectifier using a bridge rectifier

Use E core data. Bm = 1.4, Kj = 350, x= -0.15, Ap(E core) = 200cm^4, Core area Ac = 20cm^2 and mean length of turn (lmt) = 30cm, σ_p = 120 uΩ/cm, σ_s = 50 uΩ/cm