Reg. No.



MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

IV SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKE UP EXAMINATIONS, JUNE 2018

SUBJECT: ANALOG SYSTEM DESIGN [ELE 2204]

REVISED CREDIT SYSTEM

Time	e: 3 Hours	Date: 23 June 2018	Max. Marks: 50
Instr	uctions to Candidates:		
	✤ Answer ALL the questions.		
	 Missing data may be suitably 	assumed.	
1A.	Design an op-amp based voltag that load current is independen	ge to current converter with grounded load nt of load resistance.	and prove (03)
1B.	Design a single op-amp structu Vc are three independent input	rre to obtain V0=-Va +1.2Vb +0.8Vc, where ` t voltage sources. Assume Rf=10K.	Va, Vb and (03)
1C.	For the circuit shown in fig Q1c, that the negative feedback exist	, identify the terminals (A & B) of the ideal op ts in the loop. Calculate the ratio Vo/Vs.	-amp such (04)
2A.	With a neat circuit diagram, di amplifier. Derive the governing	iscuss the working of op-amp based instru equations.	mentation (03)
2B.	In the circuit shown in fig Q2b, e and $R = 1 M\Omega$, then determine V	express Vo(t) in terms of Vi(t). If Vi(t) = 2*u(Vo(t) at t = 2 seconds.	(t), C = 1μF (04)
2C.	Draw the circuit of a basic integ the suitable improvements to n	grator circuit and discuss the drawbacks. Al nake it practical.	so suggest (03)
3A.	Design a 741 op-amp based circline as shown in figQ3a. Plot to resistance of 10 k Ω to be connected op-amp. Assume that the circuit powered on.	cuit whose input and output relations with the output if an input of 8 sin ω t is applied. cted between output and non-inverting term it output is at negative supply rails when th	respect to Assume a hinal of the e circuit is (03)
3B.	Design an op-based circuit $2 \sin 6000 \ \pi t + 3 \sin 16000 \ \pi t$ $Vo(t) = 2 \sin 2000 \ \pi t + 4 \sin 6000 \ \pi t$ expressions which justifies the maximally flat response and generation of $0.01 \ \mu$ F if required.	which receives an input $Vi(t) = \sin t + \sin 10000 \pi t$ and produces an or $000 \pi t + 6 \sin 16000 \pi t$. Derive the required gain to be used in the system gain roll off of 60dB/decade for the system.	2000 πt + utput of relevant n. Assume n. Assume (04)
3C.	Design an op-amp based circ waveform of 2 KHz. For the op voltage of ±4 V as the reference	uit which generates a continuously runni -amp output level change, assume a locally for comparison. Assume capacitor of 0.1µF i	ng square generated f required. (03)

4A.	Design a 555 timer based circuit which generates the waveform as shown in fig Q4a. Assume capacitor of $0.1\mu F$ if required	(04)
4B.	Write a note on phase locked loop by explaining each block. Also list two applications of PLL.	(04)
4 C .	What are the conditions to get sustained Oscillations?	(02)
5A.	Design an op-amp based unity gain wide band pass filter to pass the signals in the frequency range 1kHz to 12 kHz. Assume a capacitance of 0.1 μ F if required.	(03)
5A. 5B.	Design an op-amp based unity gain wide band pass filter to pass the signals in the frequency range 1kHz to 12 kHz. Assume a capacitance of 0.1 μ F if required. With a neat circuit diagram explain the working of op-amp based saw tooth generator.	(03) (03)







