Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Fourth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U18EII4201: Electronic Signal Conditioning

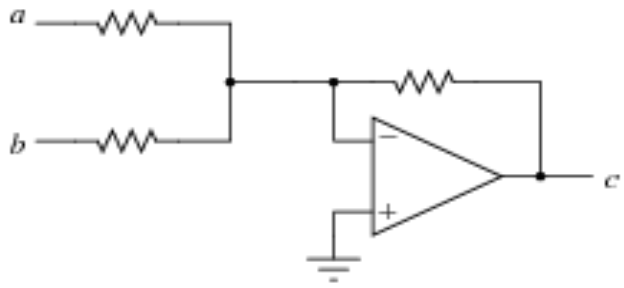
COURSE OUTCOMES

CO1: Elucidate and design the linear and non-linear applications of an op-amp.
CO2: Analyze the characteristics of various analog filters.
CO3: Classify and comprehend the working principle of data converters.
CO4: Illustrate the function of Voltage regulators, Oscillators, Relays and PLL for various applications.

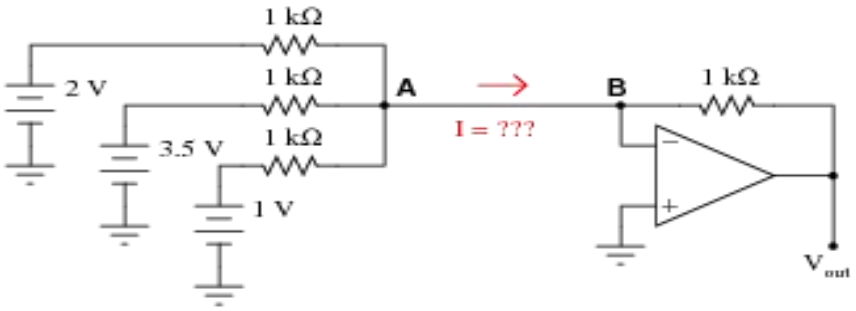
Time: Three Hours **Maximum Marks: 100**

Answer all the Questions: -
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1. Solve the mathematical equation for this op-amp circuit, assuming all resistor values are equal — CO1 [K_2]



2. Identify the amount of current from point A to point B in this circuit, and the output voltage of the operational amplifier: — CO1 [K_2]

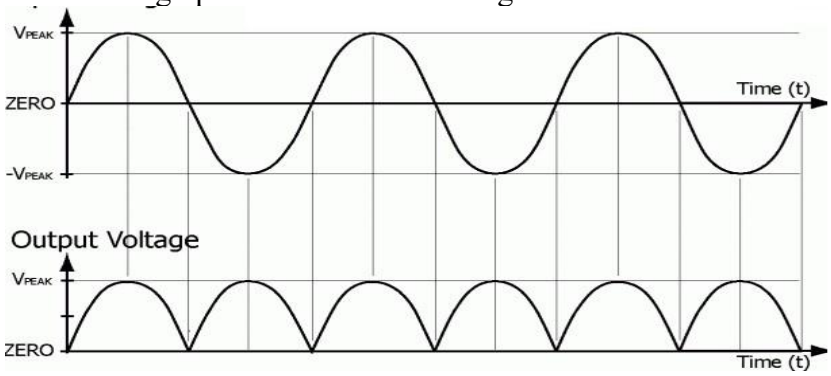


3. List the demerits of passive filters? — CO2 [K_2]
4. Draw the frequency response of first order Low Pass Filter. — CO2 [K_2]
5. How many resistors are required in a 12-bit weighted resistor DAC? — CO3 [K_2]

6.		Compare the RC and LC oscillators.		CO3	[K_2]
7.		State the function of a voltage regulator.		CO4	[K_1]
8.		Draw the shunt regulator using op-amps with Zener diode error detector.		CO4	[K_2]
9.		Define relay and give the essential quantities of protective relay.		CO4	[K_2]
10.		Define capture range of PLL.		CO4	[K_2]

Answer any FIVE Questions: -
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.		Explain the basic operation of the summing amplifier and its characteristic with neat sketch.	16	CO1	[K_2]
12.	a)	Differentiate the low pass frequency response of Butterworth, Chebyshev, Elliptic and Bessel low pass in unattainable rectangular shape of ideal magnitude with waveforms.	10	CO2	[K_2]
	b)	Explain about the limitations of the active filters over the passive filters with suitable circuits.	6	CO2	[K_2]
13.	a)	Explain the operation of a 4-bit R-2R type DAC and derive the expression for output voltage	10	CO3	[K_2]
	b)	Explain the sigma delta A/D convertor with its neat block diagram	6	CO3	[K_2]
14.	a)	Describe the working operation of rectifier for given waveform.	10	CO4	[K_2]



	b)	Compare linear regulator and switching regulator with its example.	6	CO4	[K_2]
15.		Illustrate the working of shunt and series regulator using op-amps error detector when its load varies.	16	CO4	[K_2]
16.	a)	Illustrate the working of Wien bridge oscillator with neat diagram, and compare the advantages RC Phase shift oscillator.	10	CO4	[K_2]
	b)	Compare fuse, circuit breaker and protective relay with example.	6	CO4	[K_2]

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