Q. Code:593324

Reg. No. | | | | | | | | | | | | | |

B.E. / B. TECH.DEGREE EXAMINATIONS, MAY 2024

Fourth Semester

EE22401– ANALOG ELECTRONICS

(Electrical and Electronics Engineering)

(Regulation 2022)

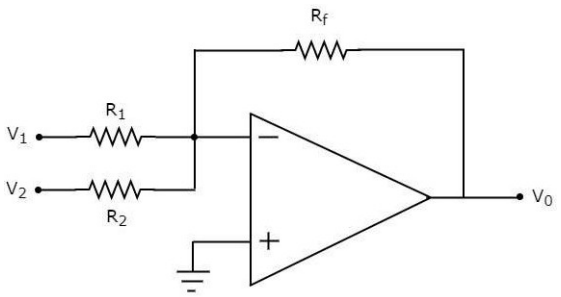
TIME:3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Comprehend the fundamental techniques for fabrications of Monolithic elements and devices.	**4**
CO 2	Demonstrate the basic applications of Op-amp.	**4**
CO 3	Construct waveform generation circuits of Op-amp and converters.	**4**
CO 4	Examine the internal schematic layout and operation of Special ICs.	**4**
CO 5	Practice with different applications based on Application IC's.	**4**

PART- A(20x2=40Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	State the importance of SiO_2 layer in IC fabrication.	**1**	**2**
2.	The npn transistors are preferred in integrated circuits compared to pnp transistors. Explain Why?	**1**	**3**
3.	Why inductors are difficult to fabricate in IC?	**1**	**2**
4.	List the various methods used for depositing thin films.	**1**	**2**
5.	Mention the techniques to minimize the effect of thermal drift in Op-amp.	**2**	**2**
6.	Find the maximum frequency for a sine wave output voltage 10V peak with an Op-amp whose slew rate is 2 V/μs.	**2**	**3**
7.	Find V_0 for the circuit shown in figure, if R_f=10KΩ,R_1=2KΩ,R_2=4KΩ.	**2**	**3**



8.	Draw the frequency response characteristics of an integrator and indicate the part where it behaves as a true integrator.	**2**	**3**
9.	State the applications of voltage to current converter.	**3**	**2**

10.	What are the advantages of active filters over passive filters?	**3**	**2**
11.	An AC signal has got a magnitude of 0.1Volt peak. Suggest the suitable half rectifier for this signal and draw its circuit diagram.	**3**	**4**
12.	State the key advantages of R-2R ladder network DAC over Binary weighted resistor DAC.	**3**	**2**
13.	What is the function of reset pin in 555 timer?	**4**	**2**
14.	Give the expression for the pulse width when 555 timer is used in monostable mode.	**4**	**2**
15.	State the problem associated with the switch type phase detector.	**4**	**2**
16.	Why VCO is called as voltage to frequency converter?	**4**	**2**
17.	What is the purpose of having input and output capacitances in three terminal voltage regulator?	**5**	**2**
18.	Give the advantages of switched mode power supply.	**5**	**2**
19.	Draw the pin diagram of LM324 single supply quad operational amplifier.	**5**	**2**
20.	List the salient features of LM380 power amplifier.	**5**	**2**

PART- B (5x 10=50Marks)

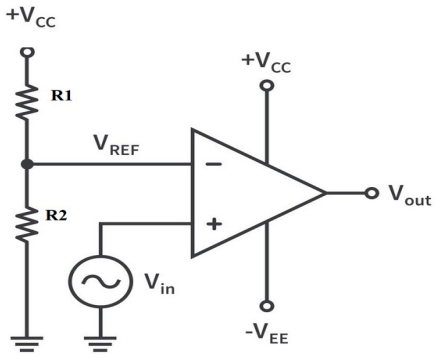
			Marks	CO	RBT LEVEL
21. (a)	State the importance of isolation, and explain the different methods of isolation techniques used in IC fabrication.		**(10)**	**1**	**3**
	(OR)				
(b)	Describe the steps involved in the fabrication of monolithic FET.		**(10)**	**1**	**3**
22. (a)	Describe the circuit configuration of non- inverting amplifier using Op-amp and derive the equation for closed loop gain.		**(10)**	**2**	**3**
	(OR)				
(b)	Design a practical differentiator circuit that will differentiate an input signal with f_{max}=100Hz.		**(10)**	**2**	**3**
23. (a)	**(i)**	Design a phase shift oscillator to generate 10KHz signal.	**(5)**	**3**	**3**
	(ii)	Design a second order butterworth high pass filter having lower cutoff frequency of 1KHz.	**(5)**	**3**	**3**
	(OR)				
(b)	Illustrate the working of successive approximation type A/D converter with a neat diagram.		**(10)**	**3**	**3**

			Marks	CO	RBT LEVEL
24. (a)	**(i)**	Design a symmetrical square wave generator of 10KHz using 555 timer	**(5)**	**4**	**3**
	(ii)	How the monostable multivibartor is used to detect the missing heartbeat.	**(5)**	**4**	**3**
		(OR)			
(b)	**(i)**	Examine the functions of all the basic building blocks of PLL.	**(5)**	**4**	**3**
	(ii)	Calculate the output frequency f_0, and lock range f_L of a 565 PLL if R_T= 10KΩ, C_T = 0.01µF and C = 10µF.	**(5)**	**4**	**3**
25. (a)		State the advantages of IC voltage regulator. Describe how the current limit protection and current boosting is achieved in general purpose 723 regulator.	**(10)**	**5**	**3**
		(OR)			
(b)		With a neat sketch, illustrate the operation of switched mode power supply.	**(10)**	**5**	**3**

PART- C (1x 10=10Marks)

(Q.No.26 is compulsory)

			Marks	CO	RBT LEVEL
26.	**(i)**	In the figure shown below has the $+V_{CC}$=15V,R_1=14KΩ, R_2=1KΩ and sinusoidal input voltage of 6V peak to peak .Sketch the output waveform.	**(6)**	**3**	**4**



	(ii)	Draw an adder circuit for the given expressionV0=-(0.1V_1+V_2+4V_3).	**(4)**	**2**	**4**

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