

Code: 20EC3401

**II B.Tech - II Semester – Regular / Supplementary Examinations
MAY- 2024**

**ANALOG CIRCUITS
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Describe the general characteristics of negative feedback amplifier and derive the expression for gain with negative feedback.	L2	CO1	9 M
	b)	The voltage gain of an amplifier without feedback is 60dB. It decreases to 40dB with feedback. Calculate the feedback factor.	L3	CO2	5 M
OR					
2		Draw the circuit diagram of voltage shunt feedback amplifier and derive the expressions for voltage gain and feedback factor.	L3	CO2 CO4	14 M
UNIT-II					
3	a)	Illustrate the working of op-amp non-inverting amplifiers. Derive the expression for its voltage gain?	L3	CO3	7 M

	b)	Design an inverting amplifier which has the closed loop voltage gain of -50. The input voltage is 200 mV with a source resistance of 500 Ohm. Determine the value of output voltage.	L3	CO3	7 M
OR					
4		What is the role of slew rate in amplifier performance analysis and also derive an expression for it. Design averaging amplifier using inverting configuration of op-amp.	L3	CO3	14 M
UNIT-III					
5		Sketch and explain simple diagram of Wein bridge oscillator using op-amp and derive its frequency of oscillation.	L3	CO2 CO4	14 M
OR					
6		Discuss Hartley oscillator and derive the equation for oscillation.	L2	CO2 CO4	14 M
UNIT-IV					
7		Sketch and analyze the functional block diagram of a 555IC timer and explain each block. How are Astable-multivibrator circuit built using the above?	L4	CO3	14 M
OR					
8		With neat circuit diagram and waveforms, explain operation of Monostable multivibrator using 555IC and derive the expression for pulse width.	L4	CO3	14 M

UNIT-V

9	Illustrate the operation of a 4-bit R-2R type DAC and derive the expression for the output voltage.	L4	CO1 CO3	14 M	
OR					
10	a)	Discuss the counter type A/D converter with the help of neat block diagram.	L2	CO1 CO3	7 M
	b)	Explain the dual slope A/D converter with the help of neat block diagram.	L2	CO1 CO3	7 M