
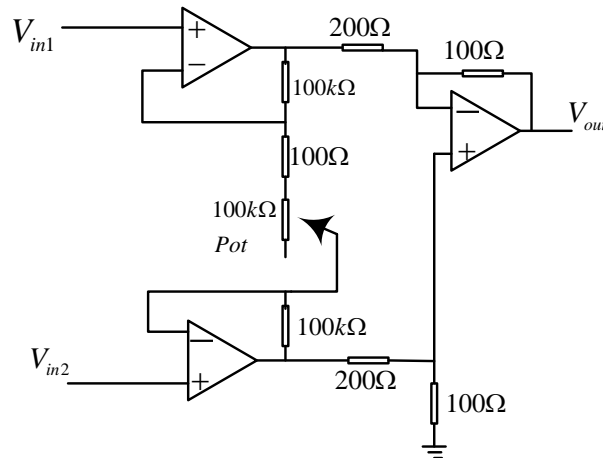


Name:			
Enrolment No:			
UPES End Semester Examination, May, 2024			
Programme Name: B Tech –Electronics and Computer Engineering		Semester : IV	
Course Name : Analog Electronics- II		Time : 3 hr	
Course Code : ECEG-2014		Max. Marks: 100	
Nos. of page(s) : 02			
Instructions: Attempt all the sections.			
SECTION A (5Qx4M=20Marks)			
S. No.	Attempt all the questions.	Marks	CO
Q 1	A single stage transistor amplifier has a voltage gain of 600 without feedback and 50 with feedback. Find the percentage of output which is feedback to the input side.	4	CO1
Q2	Explain how L-C tank circuit is used to generate AC oscillations in an electronics oscillator.	4	CO2
Q3	Differentiate the positive and negative feedback amplifiers and why important of the feedback amplifiers in electronics?	4	CO3
Q4	Explain the purpose and function of input and output capacitors in voltage regulator circuits.	4	CO4
Q5	Discuss the advantages and limitations of A-stable and mono-stable multi-vibrators in practical electronic design. When would you choose one over the other for a specific application?	4	CO4
SECTION-B (4Qx10M= 40 Marks)			
Q 6	Design and analyze the operation of following feedback connections of feedback topologies, (a) Voltage- series feedback (b) Current- series feedback	5+5	CO1
Q7	Attempt both the parts: (a) Differentiate an amplifier and oscillator systems. (b) Classify the oscillators and analyze the tuned collector oscillator circuit with suitable applications.	3+7	CO2
Q8	A three stage op-amp circuit is required to provide voltage gains of +10, -18, and -27. Design the op-amp circuit by using a 270kΩ feedback resistor for all three circuits. What output voltage will result for an input of 150μV?	10	CO3

Q9	<p>(a) Design and analyze the adjustable voltage regulator using IC 78XX series.</p> <p>(b) Using 7805, design a current source to deliver 0.2A current to a 22Ω, 10W load. Also determine the output voltage.</p>	10	CO4
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SECTION-C (2Qx20M=40 Marks)

Q 10	<p><u>Attempt both parts</u></p> <p>(a) An amplifier with a negative feedback provides an output voltage of 5V with an input voltage of 0.2V. On removing feedback, it requires only 0.1V input to provide the same output. Calculate: (i) gain without feedback (ii) gain with feedback, and (iii) feedback ratio.</p> <p>(b) The circuit shown in Fig (1) is an instrumentation amplifier. Determine the range over which its gain can be verified if potentiometer is varied over its entire range.</p>	10+10	CO1
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Q11	<p><u>Attempt both parts:</u></p> <p>(a) What is the primary function of a 555 timer IC, and how does it work? How can you calculate the frequency and duty cycle in an astable multi-vibrator circuit using a 555 timer IC? Also derive the expression for frequency and duty cycle 'D'.</p> <p>(b) An output waveform displayed on an oscilloscope provided the following measured values,</p> <p>(i) $V_{CE \min} = 1.2V$, $V_{CE \max} = 22V$, $V_{CEQ} = 10V$</p> <p>(ii) $V_{CE \min} = 2V$, $V_{CE \max} = 18V$, $V_{CEQ} = 10V$</p> <p>Determine the percentage second harmonics distortion in each case.</p>	10+10	CO4
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