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2107026

BACHELOR OF VOCATION
Robotics and Automation
Subject: Linear Integrated Circuits
Subject Code: DBEC-301
Semester: Fifth
July 2021
Theory (External): 35 Marks
Time: 03 Hours

Instructions to the Students

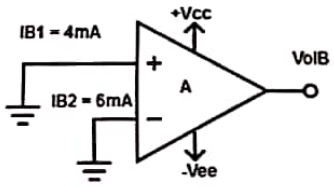
1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number											

SECTION –A (SHORT/OBJECTIVE TYPE QUESTIONS)
(10x1=10 Marks)

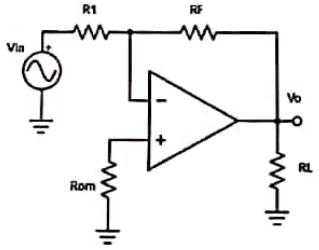
A. Input bias current is defined as
a) Average of two input bias current
b) Summing of two input bias current
c) Difference of two input bias current
d) Product of two input bias current

B. Find the input bias current for the circuit given below



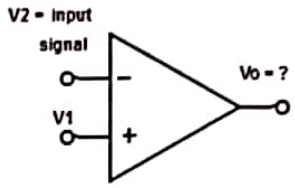
a) 10mA
b) 2mA
c) 5mA
d) None of the mentioned

C. Calculate the output voltage for the given circuit using the specification: $R_1 = 820\Omega$; $R_{OM}=811.882\Omega$; $V_{in}=10mVpp$; $V_{OIB}\cong 0$.



a) 1.025Vpp
b) 1.8Vpp
c) 1Vpp
d) 2Vpp

D. Determine the output from the following circuit



a) 180° in phase with input signal
b) 180° out of phase with input signal
c) Same as that of input signal
d) Output signal cannot be determined

E. Which factor determine the output voltage of an op-amp?
a) Positive saturation
b) Negative saturation
c) Both positive and negative saturation voltage
d) Supply voltage

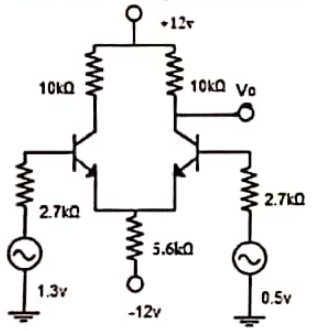
F. Find the ordering information for μA741TC.
a) Sprague 741 DIP with Industrial temperature range
b) Intersil 741 DIP with commercial temperature range
c) Fairchilds 741 DIP with commercial temperature range
d) Texas instrument 741 metal can with Industrial temperature range

G. What is the use of notch and dot in DIP ICs?
a) Determine the pin configuration
b) Designed to represent device type
c) Represent property of IC
d) Find the pin number

H. What is the reason for using Lateral pnp transistor in Integrated Circuits?
   a) Requires simple process control
   b) Simultaneous fabrication of pnp and npn transistors
   c) Provide good isolation
   d) Miniaturization and cost reduction

I. The 'buried layer' reduces collector series resistance by providing,
   a) A low resistivity current path from n-type layer to n^+ contact layer
   b) A low resistivity current path from p-type layer to n^+ contact layer
   c) A high resistivity current path from n-type layer to n^+ contact layer
   d) A high resistivity current path from p-type layer to n^+ contact layer

J. For the circuit shown below, determine the Output voltage (Assume β=5, differential input resistance=12 kΩ)



   a) 4.33v
   b) 2.33v
   c) 3.33v
   d) 1.33v

SECTION –B (ESSAY TYPE QUESTIONS)
(5x5=25 Marks)

1. What is the Operational Amplifier? What are the ideal properties of Op-Amp, Explain these?
2. Draw the Circuit diagram & explain them for following
   - Sign Changer
   - Adder
3. Design analog multiplier using emitter coupled transistor pair?
4. What is the design specification of Analog to Digital convertor?
5. What are the design specifications of Digital to Analog convertor?
6. What is the multivibrator? Discuss various types?
7. Explain the circuit & operation of Function generator?
8. Design Op amp for V-I & I-V convertor circuit? Explain its operation?

===END OF PAPER===