B.Tech- IV Semester (ECE)

COURSE CODE (CREDITS): 18B11EC411 (3) MAX. MARKS: 15

COURSE NAME: ANALOG INTEGRATED CIRCUITS

COURSE INSTRUCTORS: Dr. Shruti Jain

MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*
(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No.	Question	CO	Marks
Q1	i. For a given op-amp PSRR = 70dB, CMRR = 10^5, $A_d = 10^5$. Calculate the numerical value of PSRR. ii. If the output voltage changes by 20V in 40 µsec. Evaluate Slew rate. iii. Help Sita in drawing current mirror circuit using dual input and single output differential output. iv. Shyam wants to evaluate input impedance of level translator circuit? Help in evaluating the same and also explain each terminology used in the formula. v. Draw the different configurations of an open loop operational amplifier.	[CO 2]	5
Q2	i. Determine the output voltage of an op-amp for the input voltage V_1 =200µV, V_2= 160µV. The amplifier has differential gain of 4000 and the value of CMRR is 150. ii. Explain block diagram representation, ideal conditions, and equivalent circuit of an operational amplifier.	[CO 2]	2 + 3
Q3	i. If I_{B1} = I_{B2}= 144.87µA, and voltage gains are 100 and 125 respectively. Calculate average bias current and the offset current. ii. An emitter biased dual input balanced output differential amplifier has the following specifications: V_{CC} = 10V, $-V_{EE}$ = -10V, R_{C1} = R_{C2} = 2.7KΩ, R_{in1} = R_{in2} = 50Ω, R_E = 3.9KΩ, R'_E =100Ω, I_E = 2.02mA, V_{BE} = 0.715V, $β_{ac}$ = $β_{dc}$ = 100. Calculate the voltage gain (with and without darlington pair).	[CO 1]	3 + 2