

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
ME - SEMESTER- II(old course)• EXAMINATION (Remedial) – WINTER- 2015

Subject Code:2725204

Date: 11/12/2015

Subject Name: Designing with Modelling & FPGA's

Time:2:30 pm to 5:00 pm

Total Marks: 70

Instructions:

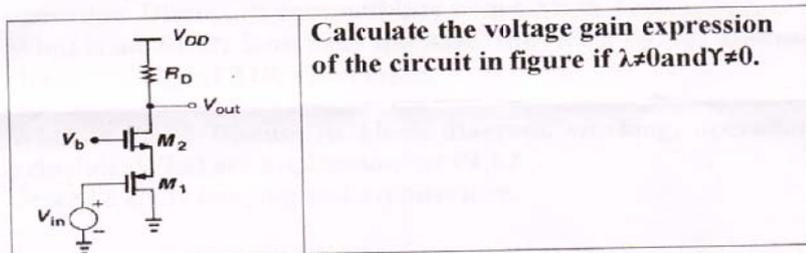
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Write short notes on two of the following: 07
i. Channel Length Modulation
ii. Sub Threshold Conduction

(b) What advantages of Source Follower make it more useful than Common Source stage? Drive expression of A_v (Voltage gain) for source follower and derive same with equivalent circuit (in case of with and without channel length modulation)? 07

Q.2 (a) In CS stage with source Degeneration configuration, explain how we obtain voltage gain? And derive same (voltage gain) with equivalent circuit? 07

(b) 07



OR

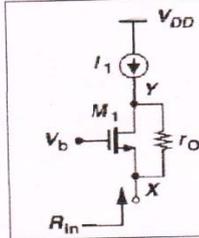
(b) For an NMOS current source, calculate the total thermal and 1/f noise in the drain current for a band from 1 kHz to 1MHz. 07

Q.3 (a) How we can resolve the issue of inaccuracy in cascade current mirror due body effect? 07

(b) What are types of feedback topologies? Discuss the any two with diagram. 07

OR

Q.3 (a)



Calculate the input resistance of the circuit using Miller's theorem.

07

(b) Discuss basic cascade current mirrors.

07

- Q.4 (a) What are advantages of two stages Op-amp over one stage op-amp? Discuss gain boosting circuit working? 07
- (b) Write short note on following (i) VCO (ii) LC Oscillator. 07

OR

Q.4 (a) What is drawback of telescopic cascades, that make is the difficult the input output shorting. Draw circuit diagram of folded cascade op-amp with cascade PMOS loads and discuss advantages over folded cascade op amp topology. 07

(b) Explain the Gilbert cell with appropriate circuits. 07

- Q.5 (a) What is difference between Negative-TC voltage and Positive-TC voltage? Draw circuit for bandgap reference and discuss its operation. Discuss its compatibility with CMOS Technology. 07
- (b) What is an ADC? How does the ADC convert a signal? Discuss characteristics of ADCs and types. 07

OR

- Q.5 (a) What is PLL? Discuss its block diagram, working, operation principle. What are applications of PLL? 07
- (b) Describe CCD imaging and architecture. 07