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Reg. No. : .....

Name : .....

Fourth Semester B.Tech. Degree Examination, February 2015
(2008 Scheme)
08.404 : ELECTRONIC CIRCUITS – II (T)
(Special Supplementary)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **4** marks :

1. What are the non-ideal characteristics of a differential amplifier ?
2. Explain Wilson current mirror circuit.
3. A differential amplifier is biased with constant current source having an output resistance of 30MΩ and output capacitance of 2pF. Find the frequency at which the CMRR decreases by 3dB.
4. Write a short note on stagger-tuned amplifiers.
5. Explain the need of frequency compensation in amplifiers.
6. What are the advantages and disadvantages of negative feedback in amplifiers ?
7. A current amplifier with a short circuit current gain of 100, input resistance of 750Ω and output resistance of 1.25KΩ is connected in negative feedback loop using shunt series feedback. The feedback network provides a feedback factor of 0.1A/A. Calculate the current gain, input resistance and output resistance of the feedback amplifier.
8. A Colpitts oscillator is designed with C1 = 0.001uF, C2 = 10uF and L = 100uH. Determine the frequency of oscillation and minimum gain to sustain the oscillation.

P.T.O.

9. Explain the need for commutating capacitor in multivibrators.

10. What are applications of sweep circuits ?

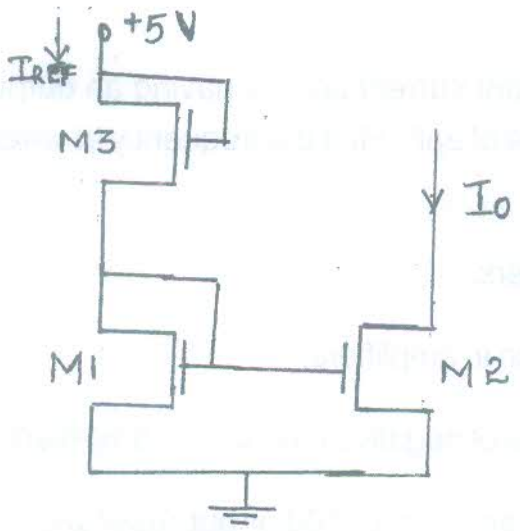
PART – B

Answer **any two** questions from **each** Module. **Each** question carries **10** marks :

Module – I

11. Derive the expressions for differential gain, common mode gain and CMRR of a BJT differential amplifier (dual-input unbalanced output configuration).

12. Design a MOSFET current mirror circuit as per the schematic diagram given below. The process parameters for the transistors are Vt = 1V, Kn' = 40uA/V^2 and $\lambda = 0$. Design the circuit such that $I_{REF} = 0.25mA$, $I_O = 0.1mA$ $V_{DD} = 5V$, $V_{SS} = 0V$and $V_{DS2(sat)} = 0.85V$.

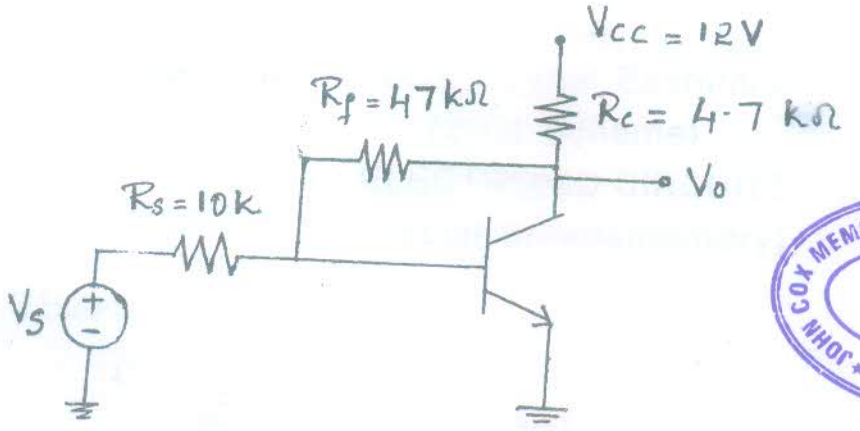


13. Derive the expression for offset voltage of a MOSFET differential amplifier taking into account mismatch in the drain resistance and mismatch in transistor parameters (W/L ration and threshold voltage).

Module – II

14. Draw the circuit diagram and small signal equivalent model of cascode amplifier. Derive the expressions for overall gain and bandwidth.

15. Determine the gain, input resistance and output resistance with feedback for the circuit shown in figure.



16. a) Two identical amplifiers are having a gain of 25dB and bandwidth 40kHz are cascaded. Calculate overall gain and bandwidth.

    b) An amplifier has a single pole at 100Hz and maximum gain of 100. Find the location of the pole if it is operated in a negative feedback loop with feedback factor 0.1. If feedback factor is changed to a value which makes closed loop gain unity, find the location of new pole.

Module – III

17. Draw the circuit diagram of a Wien Bridge Oscillator and derive expressions for its frequency of operation and feedback factor.

18. Draw the circuit diagram of a bootstrap sweep circuit and explain its working with the help of relevant waveforms.

19. Design a Schmitt Trigger circuit to operate with 6V for a UTP of 4V and LTP of 2V.
