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Reg. No. : .....

Name : .....

Fourth Semester B.Tech. Degree Examination, May 2014
(2008 Scheme)
Branch : ELECTRONICS AND COMMUNICATION
08.404 : Electronics Circuits – II (T)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions in Part – **A**. **Each** question carries **4** marks :

1. Explain the non-ideal characteristics of differential amplifier.
2. Discuss the working of a typical current mirror circuit.
3. What are the merits of stagger timed amplifiers ?
4. Explain the working of a voltage series feedback circuit.
5. Define f_B and f_T. What is the relationship between them ?
6. Show that at low frequencies the hybrid π model with $r_{b'c}$ and r_{ce} taken as infinite reduces to the approximate CE h-parameter model.
7. For a low pass single pole amplifier sketch the Bode magnitude plot and its piecewise linear approximation.
8. Consider a feedback amplifier with a single pole transfer function. What is the relationship between the high 3 dB frequency with and with-out feedback ?
9. Sketch the circuit of a RC phase shift oscillator using a BJT.
10. Draw the electrical equivalent circuit of a piezo electric crystal. Sketch the reactance versus frequency function. **(10×4=40 Marks)**

PART – B

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

Module – I

11. Draw the circuits for common mode and differential mode operation's of a differential amplifier. Also derive an expression for CMRR.

12. For the differential amplifier shown in Figure 1, below, let I = 1 mA, V_{ce} = 5V, V_{CM} = –2V, R_C = 3kΩ and β=100. Assume that the BJTs have V_{BE} = 0.7V at i_c = 1mA. Find the voltage at the emitters and at the outputs.

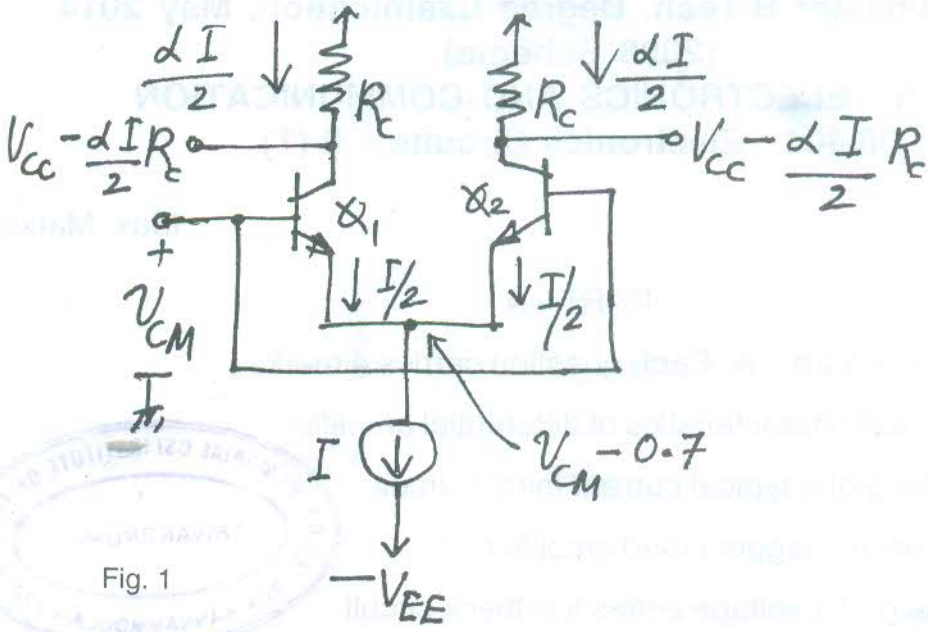

Fig. 1

13. a) A BJT differential amplifier uses a 300 μA bias current. What is the value of g_m of each device ? If β is 150, what is the differential input resistance ?
    b) A differential amplifier uses a 600μA emitter bias source, with two well matched transistors, but the collector load resistors are mismatched by 10% what input offset voltage is required to reduce the differential output voltage to zero ?

Module – II

14. Analyse a cascode amplifier for midband gain and high frequency poles.
15. Explain the working of the shunt-shunt feedback configuration. Derive expressions for closed loop gain, input resistance and output resistance, with feedback.
16. In a feedback amplifier for which A = 10^4 and A_f = 10^3, what is the gain desensitivity factor ? Find A_f exactly and approximately, in the two cases a) A drops by 10%, and b) A drops by 30%.

Module – III

17. Explain the working of a Wienbridge oscillator with a limiter used for amplitude control. Derive an expression for frequency of oscillation.
18. With the help of a circuit diagram, explain the operation of a bistable multivibrator. Suggest typical applications of bistable multivibrators.
19. Explain the functioning of a typical current sweep circuit, with a circuit diagram. What are the major applications of sweep circuits ?

(6×10=60 Marks)