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B.E / B.Tech (Full Time) DEGREE ARREAR EXAMINATIONS, NOV / DEC 2013

ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH
THIRD Semester

EC 9215 ELECTRONIC DEVICES AND CIRCUITS
(Regulation 2008)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Draw the circuit of Weinbridge Oscillator.
2. Prove that negative feedback stabilizes the gain.
3. Differentiate between LED and LASER with respect to spectral width.
4. How zener diode can be used as a regulator.
5. Draw the structure of enhancement NMOSFET.
6. Write the expression for drain current of JFET.
7. Compare CE, CB and CC with respect to current gain.
8. Calculate the drain current of NMOS operating in saturation region. Assume $K_n = 800 \mu A/V^2$ and overdrive voltage is 2V.
9. Define CMRR.
10. Why neutralization is done in tuned amplifier.

Part - B (5 x 16 = 80 marks)

- 11.(i) Define Drift current and Diffusion current density and derive expression for it. (8)
- (ii) Explain with structural diagram, the working of LASER diode. (8)

12.(a) With structural diagram of JFET, explain the V-I output and transfer characteristics of JFET.

OR

- 12.(b)(i) Distinguish between enhancement and Depletion MOSFET. Also draw the output V-I characteristics of N channel enhancement and Depletion MOSFET. (6)
- (ii) Describe the three regions of operation BJT with output characteristics and structural diagram. (10)

13.(a) With small signal equivalent circuit of CB amplifier, derive for A_{vs} , A_{is} , R_{in} and R_o .

OR

- 13.(b)(i) Draw the small signal equivalent circuit NMOS and PMOS and give the significant of every component in the circuit. (6)
- (ii) With small signal equivalent circuit of source follower derive for A_v and R_o . (10)

14.(a) Draw a single tuned amplifier and its frequency response. Derive for its $A(f)$, gain as function of frequency.

OR

14.(b)(i) Draw the circuit of BIMOS cascode amplifier. What are its special features. (6)
(ii) Draw differential amplifier using BJT. With equivalent circuit derive for differential Gain and the common mode gain. (10)

15.(a) Draw and explain the working of Colpitt oscillator. Derive for frequency of oscillation.

OR

15.(b)(i) Draw current series topological block diagram and derive for G_{mf} , R_{if} and R_{of} . (10)
(ii) What is meant by Desensitivity and derive for it. (4)
(iii) Draw an amplifier circuit with negative feedback. (2)
