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B.E./B.TECH (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2011
ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH
THIRD SEMESTER
(REGULATION 2002)

EC 291 – ELECTRONIC DEVICES & CIRCUITS

Time: 3 Hours

Max.Marks: 100

Answer ALL Questions

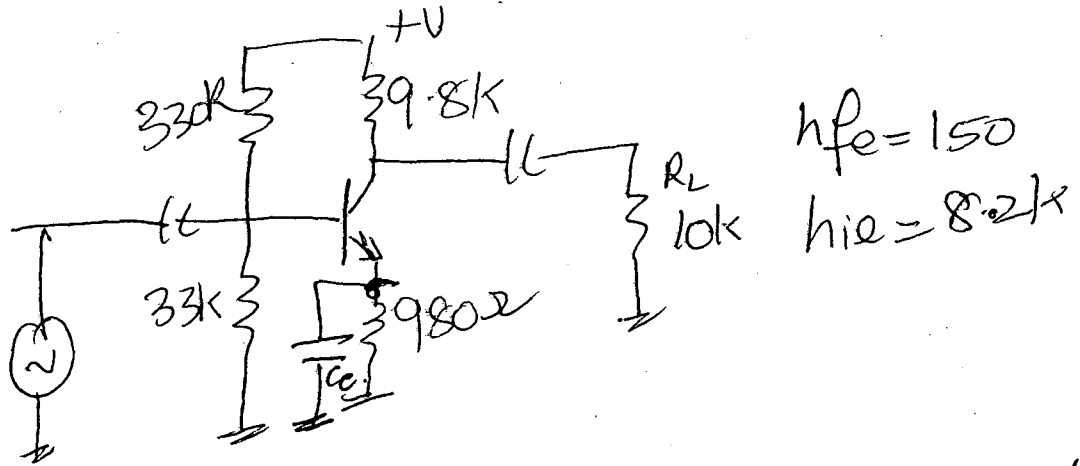
PART – A (10 x 2 = 20 Marks)

1. Draw the high frequency equivalent of a BJT.
2. Briefly explain one application of varactor diode.
3. Draw the structural diagram of MOSFET.
4. What are the different types of switching losses.
5. Draw the Darlington amplifier.
6. What is the distortion present in Class B power amplifier and how it can be improved.
7. In a tuned amplifier $f_0 = 1$ MHz and $L = 31.8 \mu\text{H}$. Calculate the capacitance.
8. In a differential amplifier $v_1 = 100$ mv and $v_2 = 200$ mv. Calculate the differential input voltage and common mode voltage.
9. Justify that negative feedback stabilize the gain.
10. In a Weinbridge oscillation $R = 5\text{K}$ and $C = 0.1 \mu\text{f}$. Calculate the frequency of oscillation.

PART-B (5X16 = 80 Marks)

- 11.(i) Draw a chopper stabilized amplifier and explain. (6)
- (ii) With equivalent circuit of differential amplifier, derive for A_d and A_c . (10)
- 12.(a) Explain VI characteristics of SCR with circuit diagram. (6)
- OR
- 12.(b) With the structural diagram describe the VI characteristics of IGBT. (16)
- 13.(a)(i) What is diffusion capacitance and derive expression for it. (8)
- (ii) Briefly explain VI characteristics of tunnel diode. (8)
- OR
- 13.(b)(i) Explain h-parameter model of BJT. (8)
- (ii) Briefly explain VI characteristics of PN junction diode.
- 14.(a)(i) Draw the topological diagram of voltage series feedback and derive for A_{vf} , R_{if} and R_{of} . (6)
- (ii) Prove that $B\omega$ of amplifier increases by $(1+A\beta)$ when negative feedback is applied. (10)
- 14.(b) Draw the circuit of Colpitt oscillator and explain how conditions for oscillation are satisfied. Also derive for frequency of oscillation. (16)

- 15.(a)(i) Draw common source amplifier and its equivalent circuit. Derive for A_v , R_{in} and R_o . (6)
- (ii) For the circuit shown, calculate A_v , R_{in} and R_o . (10)



(8)

OR

- 15.(b)(i) Compare CE and CB amplifier with respect to A_v , A_i , R_{in} and R_o . Also draw the circuit of CE and CB amplifiers. (8)
- (ii) Define Class A operation and with circuit of Class A power amplifier derive for efficiency. (8)
