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Question Paper Code : P 1241

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Third Semester

(Regulation 2004)

Electronics and Communication Engineering

EC 1203 — ELECTRONIC CIRCUITS — I

(Common to B.E. (Part-Time) Second Semester – ECE – Regulation 2005)

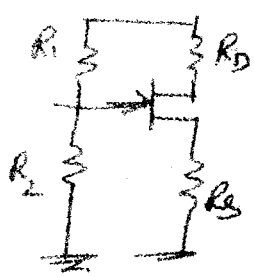
Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the factors that affect the Q point of a circuit using BJT?

2. Determine the operating point of the circuit shown.



3. Draw a common source amplifier without feedback and its equivalent circuit.

4. Define CMRR.

5. Why does gain of CE amplifier drop at high frequency?

6. Define rise time and derive the expression for it.

7. Define class C operation.

8. Determine maximum power dissipatian given $\theta_{s-c} = 1.75°C/w$, $\theta_{C-HS} = 1°c/W$, $\theta_{HS-A} = 5°C/w$, $T_j = 150°C$, $T_A = 30°C$.

9. How output voltage can be regulated with respect to load variations.

10. Compare HWR and FWR with respect to ripple factor and efficiency.

13.

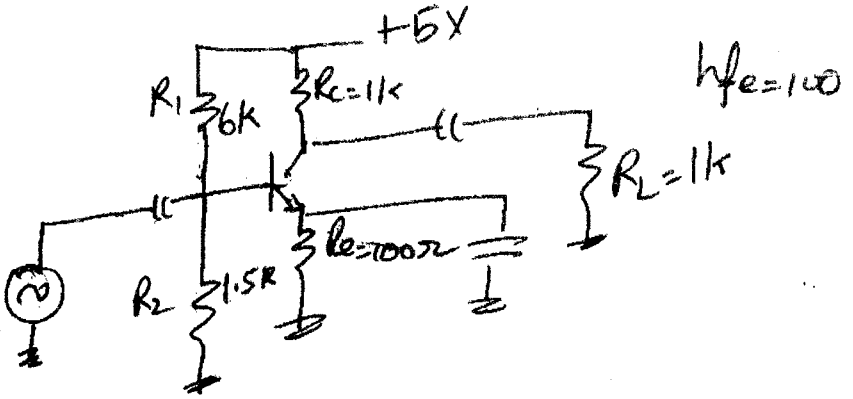
PART B — (5 × 16 = 80 marks)

11. (a) (i) Derive for stability factor of hfe variation of a fixed bias circuit and a self Bias circuit using BJT. (10)

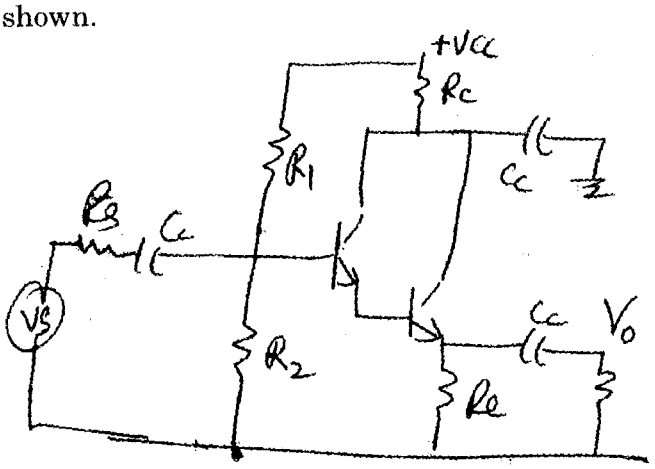
(ii) Design a biasing circuit for JFET so as to use it as variable resistor. Assume $V_{DD} = 10V$ $I_{DSS} = 8mA$ and $Vgs(off) = -4V$. (6)

Or

(b) Locate the operating point of the circuit by drawing dc and ac load lines of the circuit shown and also find the maximum peak to peak voltage.



12. (a) Derive the voltage gain, input impedance and output impedance of the circuit shown.



Or

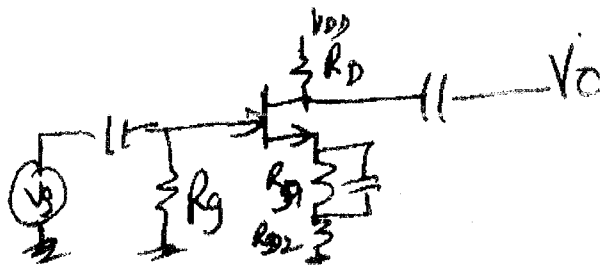
(b) (i) Draw a differential amplifier and equivalent circuit. Derive for A_d, A_c and CMRR. (10)

(ii) How can CMRR be improved? (6)

13. (a) (i) Define f_α, f_β and f_T of a transistor. (6)

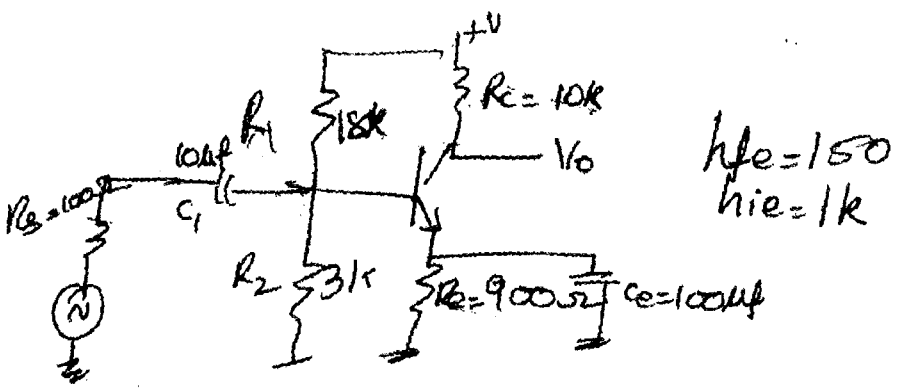
(ii) Draw a hybrid-pi equivalent circuit of a BJT and mention its significance. (6)

(iii) Draw the high frequency equivalent circuit of the circuit shown. (4)



Or

(b) Determine the mid band gain and effective lower cut-off and higher cut-off frequency of the circuit shown.



14. (a) (i) Define Class B operation. (4)

(ii) Explain class B complementary symmetry power amplifier and derive its efficiency. (8)

(iii) How is cross over distortion corrected? (4)

Or

(b) (i) Draw a transformer coupled class A power amplifier and derive its efficiency. (8)

(ii) Briefly explain class D power amplifier with circuit diagram. (8)

15. (a) (i) Derive the ripple factor of a FWR with two cascaded L-section filters. (8)

(ii) Explain the working of FWR with capacitor filter and derive its ripple factor. (8)

Or

(b) (i) How average value of ac voltage can be controlled using SCR? Derive expression for the output dc voltage as a function of firing angle. (8)

(ii) Describe with neat circuit of linear voltage regulation how line regulation and load regulation are achieved. (8)