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Question Paper Code : 31211

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2012.

Third Semester

Electronics and Communication Engineering

EC 1203 — ELECTRONIC CIRCUITS — I

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Define an A.C load line.

2. Give the advantages of Self bias.

3. Compare the performance of CE, CB, CC amplifiers with respect to voltage and current gain.

4. State Miller's theorem.

5. Define the term bandwidth.

6. Define amplifier rise time and sag.

7. Calculate the transformer turns ratio required to match a $8\,\Omega$ speaker load to an amplifier so that the effective load resistance is $6.8\,k\Omega$.

8. Why are power transistor provided with heat sink?

9. Write the expression for input and output resistance of voltage series feedback amplifier.

10. Compare the negative feedback and positive feedback.

PART B — (5 × 16 = 80 marks)

11. (a) For a circuit shown in Fig. Q(11) (a) V_{BE} active = 0.6V and β = 60. Find quiescent point and stability. (16)

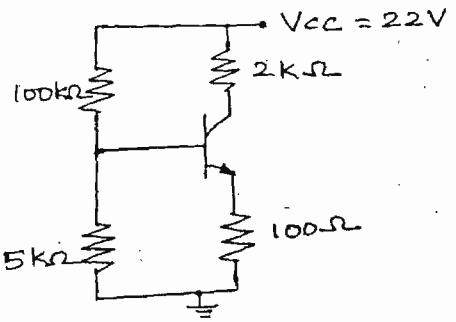

Fig. Q(11) (a)

Or

(b) (i) Calculate the operating point of the self biased JFET having the supply voltage of 20V, maximum value of drain current I_{DSS} is 10 mA and V_{GS}= –3V at I_D= 4 mA. Also determine the drain and source resistance value to obtain the bias condition. (10)

(ii) Draw two biasing circuits for an enhancement type MOSFET. (6)

12. (a) Draw the AC equivalent circuit of a CE amplifier with voltage divider bias using hybrid parameters model and derive the equations for input impedance, output impedance, voltage gain and current gain. (16)

Or

(b) Explain an emitter coupled differential amplifier and its salient features with neat circuit diagram. And also derive the expressions for CMRR, input impedance and output impedance. (16)

13. (a) Determine low cutoff frequency for the network of Fig. Q(13)(a) using following parameters ; Cs=10μF , C_E=20μF , Cc=1μF , R_S=1$k\Omega$, R_1=40$k\Omega$, R_2=10$k\Omega$, R_E=2$k\Omega$, R_C=4$k\Omega$, R_L=2.2$k\Omega$ β=100 , r_0=$\infty\Omega$, Vcc=20V .

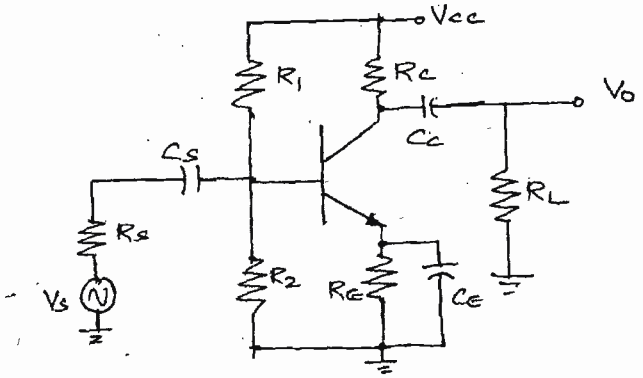

Fig. Q(13)(a)

Or

(b) Draw the equivalent circuit of source follower at high frequencies and derive expressions for voltage gain, Input Admittance and output Admittance. (16)

14. (a) (i) With neat circuit diagram explain a transformer coupled class A amplifier. (10)

(ii) In a class A amplifier $V_{CE(max)}$ = 15V, $V_{CE(min)}$ = 1V. Find the overall efficiency for series-fed load and transformer coupled load. (6)

Or

(b) (i) Draw the circuit diagram of a push- pull amplifier and explain its working. (8)

(ii) Explain the salient features and application of class D and class S amplifiers. (8)

15. (a) Calculate the voltage gain of the current series feedback amplifier shown in Fig. Q(15)(a) consider h_{fe}=120 and h_{ie}=900Ω. (16)

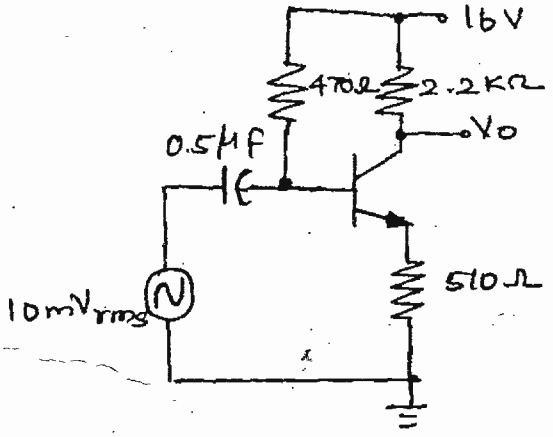

Fig. Q(15)(a)

Or

(b) Calculate the gain, input, and output impedances of a voltage series feedback amplifier having A=–300, R_i=1.5kΩ. R_o=50kΩ and β=–1/15. (16)