Question Paper Code : P 1251

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

Third Semester

Electronics and Instrumentation Engineering

EC 1261 — ELECTRONIC CIRCUITS

(Common to Third Semester Instrumentation and Control Engineering)

(Common to Fourth Semester Electrical and Electronics Engineering)

(Regulation 2004)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Mention the special features of Darlington amplifier with circuit diagram.

2.   Define class AB operation of a Power Amplifier.

3.   Draw the frequency response of double tuned amplifier for coupling coefficient, k =1, K > 1 and K < 1.

4.   A single tuned amplifier is tuned to receive the signal at 650 KHz with bandwidth of 10 KHz. Find the loaded Quality factor of the tuned amplifier.

5.   Identify the type of Feedback in the circuit shown.
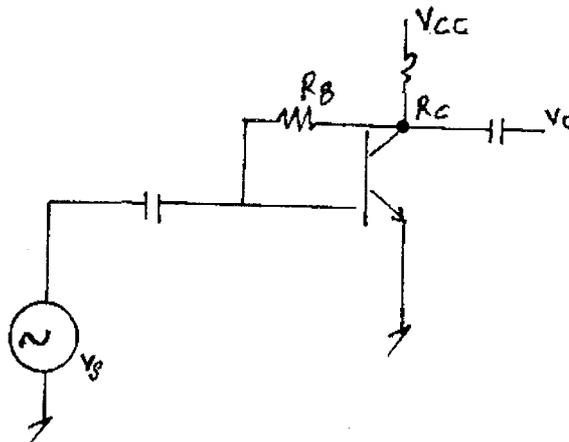
6. The following feedback network is connected to an amplifier to form Colpitts oscillation. Determine the frequency of oscillation and minimum of gain required by the amplifier.

$L_3 = 1 mH$
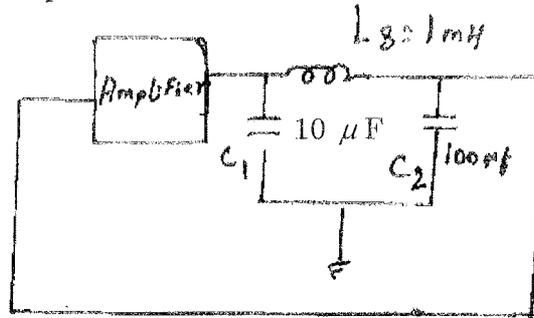
7. Draw the input and output waveform of the circuit shown below.
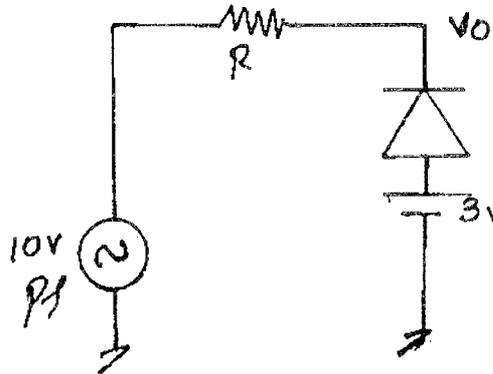
8. Draw the circuit diagram of Monostable Multivibrator showing all the current directions.

9. A switched mode regulator has input voltage range of 10 to 15 V and output voltage of 8 V. What is the range of duty cycle of the control signal to switching element?

10. Give the ripple factor of HWR and FWR.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Find A_V, A_I, R_i and R_0 of the circuit shown below. (8)

$hfe = 300$
$hie = 5.2k$
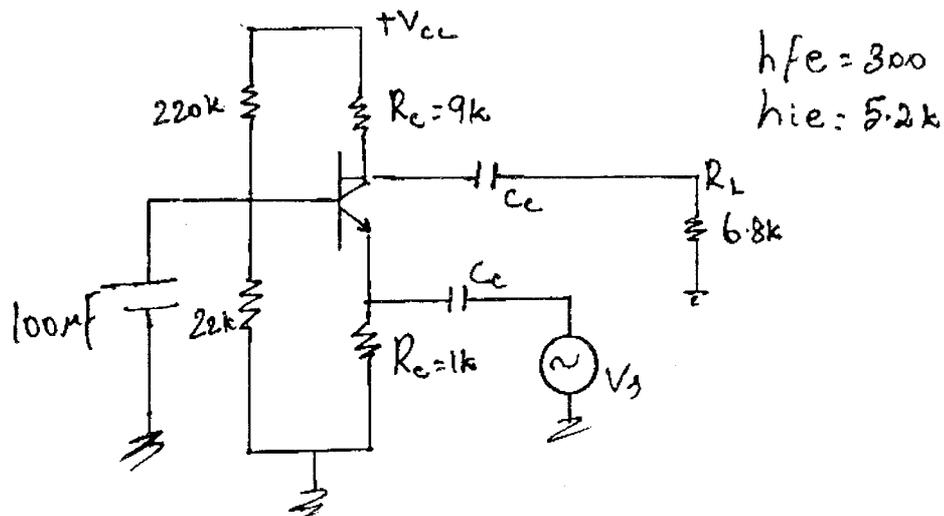
form Colpitts
imum of gain

(ii) Briefly explain self Bias of BJT and Locate its operating point. (4)

(iii) Differentiate between BJT and FET amplifiers. (4)

Or

(b) (i) With equivalent circuit derive expressions for A_V with feedback for common source amplifier. Also find R_{in} and R_0. (8)

(ii) Explain class A transformer coupled power amplifier. Derive its efficiency. Draw the dc load and ac load of the amplifier and locate the operating point. (8)

12. (a) Draw a differential amplifier and its equivalent circuit. How is it different from other amplifiers? Derive for A_d, A_c and CMRR.

Or

(b) Mention the characteristics of single tuned amplifier. Draw a single tuned amplifier and derive for its A(f) and also derive its cut-off frequencies with equivalent circuit.

the current

and output
o switching

13. (a) Design a Schmitt trigger circuit for VTP = 6 V and LTP = 4 V with VCC = 20 V, h_{fe} = 200 and IC_2 = 2 mA. Draw the circuit and its hystersis characteristics.

Or

(8)

(b) Draw the collector coupled Monastable multivibrator for stable state and Quasi stable state with all current directions. Explain the working of the circuit and derive for T_{ON}. Also draw the base and collector waveforms.

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14. (a) (i) Define Barkhausen conditions of oscillation. (4)

(ii) Draw the circuit of phase shift oscillator using BJT. Explain how the conditions of oscillation are met. (6)

(iii) Design a Wien Bridge oscillator to generate sinewave at 10 KHz. Draw the circuit and the output waveform. (6)

Or

(b) (i) Find $\dfrac{V_o}{V_{in}}$ for the following circuit. (4)
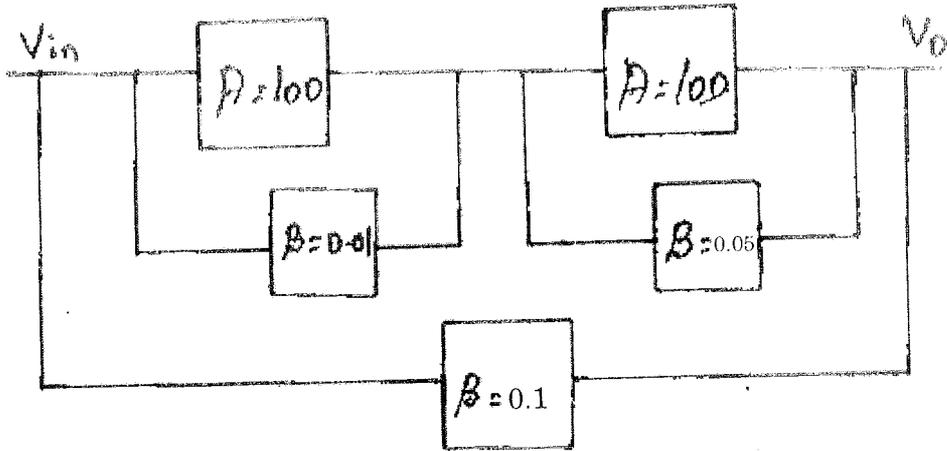
(ii) Consider the following circuit
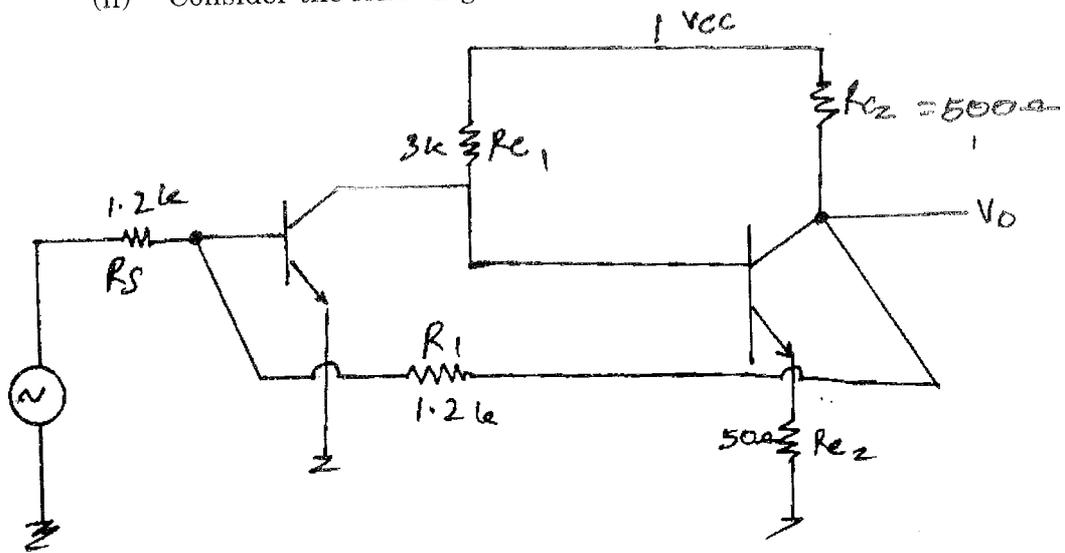
Here, $h_{fe} = 50$

$h_{ie} = 1.1\,k$

for both transistors.

Identify the type of feedback. Draw the basic amplifier without feedback. Determine the gain and feedback factor for the amplifier with and without feedback. (12)

15. (a) Explain the line and load regulation of switched mode Regulator with the neat circuit diagram. (16)

Or

(b) (i) Explain the FWR with capacitor filter. Derive for its ripple factor. (10)

(ii) Draw the circuit diagram and explain the function of series voltage regulator. (6)