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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 80121

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth Semester

Electronics and Communication Engineering

EC 8452 — ELECTRONIC CIRCUITS — II

(Common to Electronics and Telecommunication Engineering)

(Regulation 2017)

Time : Three hours Maximum : 100 marks.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why frequency compensation is required in amplifiers?

2. What is gain margin?

3. Draw the electrical equivalent circuit of crystal.

4. What is the need for amplitude control in oscillators?

5. State the difference between loaded and unloaded Q.

6. What is the basic principle behind tuned amplifiers?

7. State the condition under which the RC high pass filter can act as a differentiator.

8. Why clamper circuit is called DC restorer?

9. Define the term Total Harmonic Distortion.

10. What is a DC/DC converter?

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the effects of negative feedback on the properties of amplifiers in detail with relevant analytical expressions.

Or

(b) Discuss in detail about the impact of feedback on the amplifier with single and two poles.

12. (a) With relevant diagrams, explain the operation of (i) Ring oscillator and (ii) Crystal oscillator.

Or

(b) With a neat diagram, explain the operation of the Wien-bridge oscillator. Also derive the expression for the frequency of oscillation.

13. (a) Explain how flat band response is achieved in stagger tuned amplifier?

Or

(b) Discuss on the effect of cascading single and double tuned amplifier on bandwidth.

14. (a) With circuit diagram, waveforms and relevant expressions explain the operation of (i) Attenuator and (ii) RC integrator.

Or

(b) Explain with circuit diagram, waveforms and relevant expressions the operation of UJT oscillator.

15. (a) Explain the different classes of power amplifiers and compare them.

Or

(b) Explain the working of the three commonly used DC/DC converters with circuit and response diagrams.

PART C — (1 × 15 = 15 marks)

16. (a) Consider a three-pole amplifier with a loop gain function given by,

$$T(f) = \frac{10^5}{\left(1+j\frac{f}{5\times10^5}\right)\left(1+j\frac{f}{10^2}\right)\left(1+j\frac{f}{5\times10^8}\right)}$$

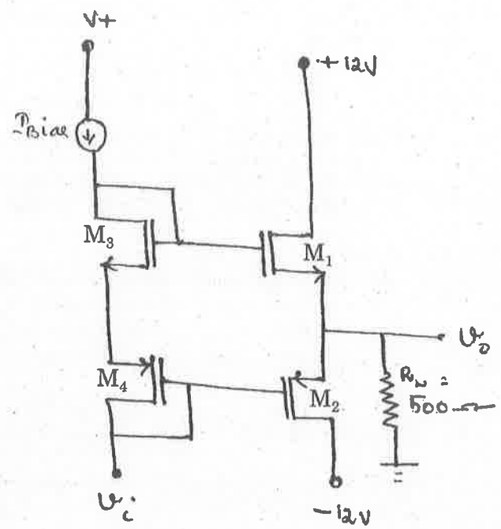
Stabilize the circuit by inserting a new dominant pole. Assume the original poles are not altered. At what frequency must the new pole be placed to achieve a phase margin of 45 degrees?

Or

(b) An enhancement-mode MOSFET class-AB output stage is shown in the Fig.16(b). The threshold voltage of each transistor is $V_{TN} = -V_{TP} = 1v$ and the conduction parameters of the output transistors are $K_{n1} = K_{p2} = 5\ mA/V^2$. Let $I_{Bias} = 200\mu A$.

(i) Determine $K_{n3} = K_{p4}$ such that the quiescent drain currents in M_1 and M_2 are 5 mA. (6)

(ii) Find the small-signal voltage gain $A_v = d_{v0}/d_{v1}$ at $v_0 = 5v$. (9)



Reg. No. :

Question Paper Code : 90184

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Fourth Semester

EC8452 – ELECTRONIC CIRCUITS – II

(Common to Electronics and Communication Engineering/Electronics and Telecommunication Engineering)

(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Discuss the advantages of negative feedback in amplifiers.
2. A feedback amplifier has an open loop gain of 600 and feedback factor $\beta = 0.01$. Find the closed loop gain with feedback.
3. State the Barkhausen criterion for an oscillator.
4. If $L_1 = 1$ mH, $L_2 = 2$ mH and $C = 0.1$ nF, observe the frequency of oscillation for Hartley oscillator.
5. Mention two applications of tuned amplifiers.
6. Define loaded Q and unloaded Q of tuned circuit.
7. Describe a simple clamper circuit.
8. Outline the applications of astable multivibrator.
9. Which power amplifier gives minimum distortion ? Why ?
10. List the applications of MOSFET power amplifier.

PART – B **(5×13=65 Marks)**

11. a) Illustrate the current series feedback connection and derive the expressions for gain, R_{if} and R_{of}.

(OR)

b) i) Build the circuit diagram of voltage shunt feedback amplifier. **(5)**

ii) Derive the expressions for R_{if}, R_{of}, current and voltage gain. **(8)**

12. a) Explain the operation of Wien bridge oscillator with a neat circuit diagram and derive the expression of frequency of oscillation. **(13)**

(OR)

b) i) Explain the operation of Colpitts oscillator and derive the expression of its frequency of oscillation. **(10)**

ii) If C_1 and C_2 are 200 PF and 50 PF respectively. Calculate the value of inductance for producing oscillations at 1 MHz in the Colpitts oscillator circuit. **(3)**

13. a) Draw the single tuned amplifier and explain the frequency response. Derive the expression for its gain and cutoff frequency. **(13)**

(OR)

b) Conclude the following with neat circuit diagram :

i) Hazeltine neutralization. **(7)**

ii) Neutrodyne neutralization. **(6)**

14. a) i) Classify the various types of diode clippers. **(6)**

ii) For a transistor switching circuit predict the collector current response and other parameters for the input of pulse waveform. **(7)**

(OR)

b) With neat circuit diagram and suitable wave forms, explain the operation of a Collector coupled transistor Astable Multivibrator. **(13)**

15. a) i) Explain the operation of the transformer coupled class A audio power amplifier. **(7)**

ii) Explain the terms conversion efficiency and maximum value of efficiency used in audio power amplifiers. **(6)**

(OR)

b) Describe the operation of class C amplifier and derive its efficiency. **(13)**

PART – C

(1×15=15 Marks)

16. a) Identify the working principle of RC phase shift oscillator circuit diagram, also derive the expression for frequency of oscillation and condition for sustained oscillation. **(15)**

(OR)

b) Examine the working of Miller and Pierce crystal oscillators with neat circuit diagrams. Compare them and comment on their features. **(15)**
