

Register Number: .....

**B.E. DEGREE EXAMINATIONS: APRIL/ MAY 2012**

Fourth Semester

**ELECTRONICS AND COMMUNICATION ENGINEERING**

ECE106: Electronic Circuits II

**Time: Three Hours**

**Maximum Marks: 100**

**Answer ALL Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. The voltage gain of a certain amplifier without feed back is 400. If the feed back ratio is 0.1, the voltage gain of the amplifier with negative feed back is  
a) 97.6      b) 9.76      c) 4000      d) 40
2. A common emitter transistor amplifier employing an non bypassed series emitter resistance is a case of  
a) Current series feed back      b) voltage shunt feed back  
c) voltage series feed back      d) current shunt feed back
3. Crystal oscillators are superior to tuned LC oscillators mainly because of their  
a) Exceptionally high degree of frequency stability      b) High value of Q factor  
c) size of the crystal      d) both (a) and (b)
4. The tuned LC oscillators are not suitable at low frequencies , because  
a) size of L and C becomes very small and difficult to manufacture  
b) size of L and C becomes very large and practically difficult to manufacture  
c) it is not possible to have positive feed back at low frequencies  
d) none of the above
5. If the Q factor of a resonant frequency is doubled, its band width is  
a) doubled      b) halved      c) quadrupled      d) remains the same
6. An amplifier has a pass band from 745KHz to 755KHz, and a resonant frequency of 750 KHz. Its bandwidth is  
a) 5KHz      b) 75 KHz      c) 10KHz      d) 20KHz
7. When a transistor is driven into saturation, its collector voltage is  
a) 0      b)  $V_{CE(sat)}$       c)  $V_{cc}$       d)  $V_{BE}$
8. If the input to a differentiating circuit is a triangular wave, then the output will be  
a) square wave      b) rectangular wave      c) saw tooth wave      d) sine wave

9. The sweep period in a sweep circuit using Uni junction transistor is
- a) Directly proportional to R      b) inversely proportional to R  
 c) Directly proportional to C      d) Directly proportional to the product RC
10. Which of the following sweep circuit is used in television receivers for display
- a) Voltage time base generator    b) Current time base generator  
 c) Bootstrap sweep circuit        d) none of the above

**PART B (10 x 2 = 20 Marks)**

11. Calculate the voltage gain, input and output resistance of a voltage series negative feedback amplifier having  $A = 300$ ,  $R_i = 1.5\text{K}\Omega$ ,  $R_o = 50\text{K}\Omega$  and  $\beta = 1/15$ .
12. List the effect of negative feedback on various characteristics of the amplifier.
13. Draw the electrical equivalent circuit of a crystal.
14. Why do we need three RC networks for a RC phase shift oscillator? Can it be two or four.
15. A parallel LC circuit consists of a capacitor of  $300\text{pF}$  and an inductance of  $100\mu\text{H}$ . The Inductor has a resistance of  $5\Omega$ . Find the value of resonant frequency and circuit impedance at resonance.
16. What is stagger tuning and what are the advantages of stagger tuning?
17. Draw the circuit diagram of a clipper to clip a  $5\text{V}$  sine wave input signal at  $+3\text{V}$  and  $-2\text{V}$ .
18. Enumerate the conditions under which an RC circuit behaves as an integrator.
19. Define sweep speed error.
20. What are the methods to generate a time base wave form?

**PART C (5 x 14 = 70 Marks)**

21. a) With neat diagram, explain the current series feedback amplifier and also derive the expressions for feedback ratio, input resistance output resistance and voltage gain.

**(OR)**

- b) (i) Discuss the classification of feedback amplifiers with schematic(topology). How is impedance level modified in each type? (8)
- (ii) The mid band voltage gain of a certain amplifier is 500. Its upper half power frequency  $f_2$  is  $20\text{KHz}$  and lower half power frequency  $f_1$  is  $20\text{Hz}$ . What will be the

upper and lower half power frequencies and voltage gain , if 2% negative feed back is introduced? (6)

22. a) Explain the operation of a transistorized Wein bridge oscillator with the help of neat diagram. How is amplitude stability achieved in this circuit.

**(OR)**

b) (i) What are the factors which affect the frequency stability of an oscillator? (6)

(ii) A colpittsoscillator is designed with  $C1 = 100\text{pF}$  and  $C2 = 7500\text{pF}$ . The inductance is variable. Determine the range of inductor values, if the frequency of oscillations to vary between 950 kHz and 2050kHz. (8)

23. a) (i) Draw the circuit of class C tuned amplifier and explain its operation with relevant wave forms. (7)

(ii) Discuss the Hazeltine method of neutralization with circuit. (7)

**(OR)**

b) Explain the operation of single tuned amplifier with necessary diagrams and derive the expression for 3dB bandwidth.

24. a) With neat diagrams explain the operation of schmitt trigger circuit and derive LTP and UTP levels.

**(OR)**

b) (i) Explain the operation of collector coupled Astable multivibrator with necessary diagrams. (10)

(ii) An astable multivibrator has  $R1=R2=20\text{k}\Omega$  and  $C1=C2=100\text{pF}$ . Calculate the frequency of oscillation. (4)

25. a) Explain the working of a Bootstrap sweep circuit. Also derive the expression for sweep speed error.

**(OR)**

b) With neat circuit diagram, explain monostable blocking oscillators with base and emitter timing.

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