

107

JAYA GROUP OF INSTITUTIONS

4th SEMESTER – B.E/B.TECH

MODEL EXAMINATION - I

SUBJECT TITLE: ELECTRONIC CIRCUITS II

DATE : 28 /01/2015

SUBJECT CODE: EC6401

BRANCH/DEPARTMENT: B.E/ECE

MAX.MARKS : 100

PART A

1. Define feedback factor.
2. A feedback amplifier has an open loop gain of 600 and feedback factor $\beta = 0.01$. Find the closed loop gain with negative feedback.
3. What are the advantages of negative feedback in amplifiers?
4. State the Nyquist criterion for stability of feedback amplifiers.
5. What is the effect on input and output impedance of an amplifier if it employs voltage series negative feedback?
6. State the Barkhausen criterion for an oscillator.
7. Draw the electrical equivalent circuit of crystal and mention the significance of each component.
8. In RC Phase shift oscillator if $R_1 = R_2 = R_3 = 200 \text{ k ohm}$ and $C_1 = C_2 = C_3 = 100 \text{ pF}$, find the frequency of the oscillator.
9. What is the necessary condition for a Wein bridge oscillator circuit to have sustained oscillations?
10. In a Hartley oscillator, if $L_1 = 0.2 \text{ mH}$, $L_2 = 0.3 \text{ mH}$, $C = 0.003 \text{ }\mu\text{F}$, Calculate the frequency of its oscillations.

PART B

11. a) Discuss the effects of negative feedback on various amplifier parameters. (16)
(or)
b) (i) If an amplifier has a bandwidth of 300 kHz and voltage gain of 100, what will be the new bandwidth and gain if 10 % negative feedback is introduced? What will be the gain bandwidth product before and after feedback? What should be the amount of feedback if the bandwidth is to be limited to 800 kHz. (8)
(ii) Draw the equivalent circuit of current series amplifier. Derive input impedance, output impedance of current series feedback amplifier. (8)
12. a) Draw the circuit diagram for voltage series and voltage shunt amplifier. Derive its input impedance, output impedance and transfer ratio. (16)
(or)
b) Discuss about Nyquist criterion for stability of feedback amplifiers. Discuss about the effects of negative feedback on amplifier poles. (16)
13. (a) An amplifier without feedback gives a fundamental output of 36 V with 7% second harmonic distortion when the input is 0.028 V.

(i) If 1.2 % of the output is feedback into the input in a negative voltage series feedback circuit, what is the output voltage?

(ii) if the fundamental output is maintained at 36 V but the second harmonic distortion is reduced to 1% what is the input voltage?

(or)

(b) Explain the function of RC Phase shift oscillator and derive its frequency of oscillations. (16)

14. (a) Draw the circuit diagram of Wein bridge oscillator and derive the frequency of oscillations.

(or)

(b) Explain the working of Hartley oscillator with circuit diagram and derive its frequency of oscillations. (16)

15. (a) Explain the working of Colpitts oscillator with circuit diagram and derive its frequency of oscillations. (16)

(or)

(b) Draw and explain the operation of Franklin oscillator. State the features and applications of Franklin oscillator. (16)