

YMCA UNIVERSITY OF SCIENCE AND TECHNOLOGY
B.TECH EXAMINATION (UNDER CBS), MAY 2018
ANALOG INTEGRATED CIRCUITS (E305)

121

Time: 3hrs

M.Marks:60

NOTE: Attempt all the questions in part 1 with brief answers (word limit 20-40). Attempt any four Question from part 2. The marks are indicated in front of each question.

PART-1(EACH QUESTION CARRY 2 MARKS)

Q.No.1. Answer the following:

- I. State the merits of negative feedback in amplifier ?
- II. What do you mean distortion in amplifiers?
- III. Draw only circuit diagram of crystal- oscillator.
- IV. Why a power amplifier is always preceded by a voltage amplifier?
- V. Indicate an OP-AMP connected as (a) a scale changer (b) a phase shifter.
- VI. The output voltage of a certain OP-AMP circuit change by 25V is $5\mu s$. What is slew rate?
- VII. What is an oscillator? Give Barkhausen criteria.
- VIII. Draw only circuit diagram of sample and hold circuit.
- IX. Give any four applications of logarithmic amplifier.
- X. Give definition of A and C power amplifier.

PART-2

Q.No.2(a) If n amplifier are connected in cascade, each having higher cut-off frequency f_H . The overall cut-off frequency of cascaded circuit is f_H^* . Determine the relation between f_H and f_H^* . (5)

(b) Explain R-C coupled amplifier. Discuss the frequency response curve and phase-shift curve. (5)

Q.No.3(a) Discuss effect of negative feedback on input impedance and output impedance for voltage-series feedback, Derive it. (5)

(b) A class- A power amplifier uses a transformer as a coupling device. The transformer has a turn ratio of 10 and the secondary load is $10\ \Omega$. If the zero signal collector current is 100 mA, find the maximum power output. (5)

Q.No.4(a) Draw the circuit of Wein-bridge oscillator and Explain its operation and determine the frequency of oscillation. (5)

(b) Drive expression for overall efficiency of class B Push-pull power amplifier & draw its dig. (5)

Q.No.5(a) A crystal-oscillator has following parameters, $L=0.33$ henry, $C=0.065$ Pf, $C_m=1.0$ pF and $R=5.5$ k- Ω , find series and parallel resonant frequency and find Q-factor of the crystal. (5)

(b) A 5mV, 1Khz sinusoidal signal is applied to the input of an OP-AMP integrator for which $R_1=100K\Omega$ and $C=1\mu F$ find the output voltage. (5)

Q.No.6(a) Draw the circuit for antilog amplifier using op-amp and derive the expression for output voltage. (5)

(b) What is the maximum closed-loop voltage gain that can be used when the input signal varied by 0.5V in $10\mu s$, for an OP-AMP having slew rate $SR = 4V/\mu s$? (5)

Q.No.7(a). Give characteristics of ideal OP- AMP .

(5)

(b) Write short note on any two.

(5)

(1) AC coupled amplifier.

(2) IC-555 timer as astable multivibrator.

(3) Voltage to current convertor