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

Question Paper Code: 34402

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Fourth Semester

Electronics and Communication Engineering

01UEC402 – ANALOG CIRCUITS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What are the essential conditions for maintaining oscillations in a circuit?
2. A certain *X*-cut quartz crystal resonates at 500 *kHz*. It has equivalent inductance of 4.2 *H* and an equivalent capacitance of 0.03 *pF*. If its equivalent resistance is 500 Ω, calculate the Q-factor.
3. Define duty cycle D.
4. What is a multi-vibrator? How are they classified?
5. List the limitations of integrated circuits.
6. Define slew rate.
7. Draw the circuit of a voltage to current converter with floating load.
8. Define capture range, lock-in range and pull-in-time of a PLL.
9. List the various A/D conversion techniques.
10. What are the modes of operation of a timer?

PART - B (5 x 16 = 80 Marks)

11. (a) Draw the circuit of Hartley oscillator and explain its working. Derive the expressions for frequency of oscillation and condition for starting of oscillation. (16)

Or

(b) In a Colpitt's oscillator, the values of the inductors and capacitors in the tank circuit are L = 40*mH*, C_1 = 100*pF* and C_2 = 500*pF*.

(a) Find the frequency of oscillation

(b) If the output voltage is 10*V*, find the feedback voltage

(c) Find the value of C_1 for a gain of 10*V*, also find the new frequency of oscillation. (16)

12. (a) Give a detailed account of diode clippers and clampers (16)

Or

(b) Give a detailed account on the principle and working of Astable multivibrators. (16)

13. (a) Explain the steps involved in the manufacturing process of an diode in IC. (16)

Or

(b) Enumerate the Ac characteristics of op-amp. (16)

14. (a) Draw and explain the operation of phase shifter circuit with necessary expressions. (16)

Or

(b) With a neat block diagram explain the working of phase locked loop. (16)

15. (a) (i) Construct R-2R DAC and find the output for the binary word 1001. (8)

(ii) Explain the working principle of dual slope ADC with neat sketch. (8)

Or

(b) (i) Draw the pin configuration and functional diagram of a 555 timer. Explain the functional diagram. (16)