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

Question Paper Code: 31442

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

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. The output voltage of a certain op-amp circuit changes by 20 *V* in 4 μs. Find its 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) Describe the construction of phase shift oscillator and explain its working. (16)

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

Or

(b) Calculate the component values of a monostable multivibrator developing an output pulse of 140 μs duration. Assume h_{FEmin} = 20, $I_{c(sat)}$ = 6 mA, V_{CC} = 6 V, V_{BB} = -1.5 V. (16)

13. (a) Explain the construction of a monolithic bipolar transistor with neat diagrams. (16)

Or

(b) (i) Discuss the various operational amplifier stages. (6)

(ii) Explain the open loop op-amp configurations in detail. (10)

14. (a) Discuss the operation of logarithmic amplifiers in detail. (16)

Or

(b) Write short notes on

(i) Peak detector

(ii) Voltage controlled oscillators. (16)

15. (a) Discuss the various types of DACs in detail. (16)

Or

(b) Explain the construction and various features of 723 general purpose regulators. (16)

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