ECA53 ELECTRONIC CIRCUITS AND PCB DESIGN

TUTORIAL SHEET -4

LC Oscillator-Non sinusoidal Oscillator

S.No	UNIT II	Marks CO2
Q11	In an RC phase shift oscillator, the resistance is 8.2KΩ and the capacitance is 0.047μf. Determine the frequency of oscillation. In a Wien Bridge Oscillator circuit, if **R1 = R2 = 22KΩ** and **C1 = C2 = 0.01μf**, determine the oscillation frequency.	10
Q12	In a Hartley oscillator circuit, the values of the inductors are **50mh** and **30mh**, and the capacitor is **100Pf**. Determine the oscillation frequency.	10
Q13	In a UJT sweep circuit, R = 100KΩ, C = 0.01 μF and η = 0.8. Find the frequency of the oscillations.	10
Q14	A uni-junction transistor with n = 0.62 (intrinsic stand-off ratio) is used in a relaxation oscillator circuit with R = 5 KΩ and C = 0.05 μF. 1) Determine the period and frequency of oscillation 2) Determine the new value of R, which must be changed in order to obtain a frequency of oscillation of 50 Hz. 3) If C is increased by a factor of 10, how the value of R changes, if the frequency is to be 50 Hz	10

Q15	In a sample UJT sweep circuit, the resistance and capacitance are 100 k and 0.4 μF. The ratio of peak-point voltage to supply voltage is 0.57. 1) Find the frequency of the sweep. 2) If C is increased to 0.5 μF, what should be the value of R to maintain the same frequency of sweep.	10
Q16	A Colpitts oscillator uses a BJT with the following parameters C1=12 Pf, C2=8 Pf, Inductor L=1.5 mh Determine the oscillation frequency (fosc) of the circuit	10
Q17	In a sample UJT sweep circuit, the resistance and capacitance are 100 k and 0.4 μF. The ratio of peak-point voltage to supply voltage is 0.57. 1) Find the frequency of the sweep. 2) If C is increased to 0.5 μF, what should be the value of R to maintain the same frequency of sweep.	10
Q18	A crystal has L = 0.33 H , C = 0.065 Pf and CM = 1 Pf with R = 5.5KΩ. Find i)Series resonant frequency ii)Parallel resonant frequency iii)By what percent does the parallel resonant frequency exceed the series resonant frequency? iv) Find the Q factor of the crystal.	10
Q19	A quartz crystal has the following constants, L = 50 mH, C_1 = 0.02 Pf, R = 500Ω and C2 = 12 Pf. Find the values of fs and fp. If the external capacitance across the crystal changes from 5 Pf to 6 Pf, find the change in frequency of oscillations	10
Q20	(b) A crystal has L = 2 H, C = 0.01 Pf and R = 2 KΩ. Its mounting capacitance is 2 Pf. Calculate it series and parallel resonating frequency. (ii)The equivalent circuit of a crystal has the values of L = 0.7 H, C = 0.01 Pf, R = 1000Ω & and Cm = 2 Pf. Calculate series resonant frequency, parallel resonant frequency and quality factor of the crystal.	10