University	:	Menoufia		Date	:	01/04/2019
Faculty	:	Electronic Engineering		Time	:	1 Hour
Department	:	Electronics and Electrical Comm.		No. of pages	:	4
Academic level	:	3rd Year		Full Mark	:	20 Marks
Course Name	:	Communications Circuits		Exam	:	Midterm Exam
Course Code	:	ECE 321		Examiner	:	Dr: Saied M. Abd El-atty

Answer the followings Questions .... :الفصل .... اسم الطالب \ الطالبة ....

Q1: (a) Draw the block diagram for an Superheterodyne broadcast receiver. It is to have one RF stage and an IF frequency of 10.7 MHz. The local oscillator will operate above the signal frequency. Indicate on the diagram the frequency or frequencies at which each stage operates when the receiver is receiving a station at 94.5 MHz.

(b) What is the image frequency of the receiver described above?

(c) Give two ways in which the image rejection of the receiver could be improved.   (3M)

Q2: List the receiver Specifications and why you need AGC circuit?   (2M)

P.T.O

Q₃: For the following PLL shown below, Determine: **(5M)**

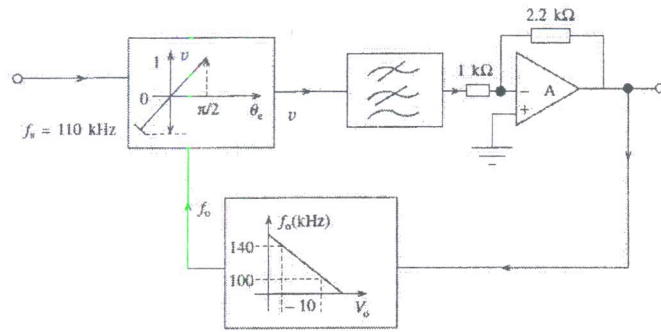   a) K_D, K_V, K_O and K_L;   b) the values of R and C for the filter;

    c) the value of V_i, v and θ_e under lock conditions;   d) the lock range.

Q4: State the Advantages and Disadvantages of direct synthesis, then design a direct frequency synthesizer generating 99 discrete frequencies from 18 crystal oscillators. **(3M)**

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Q5: Explain a communication circuit used for coherent amplitude demodulator-based PLL. **(2M)**

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Q₆: a) Draw a communication circuit for Pierce oscillator (2M)

b) The Colpitts oscillator shown in Figure is oscillating at 200 MHz. The transconductance g_m of the FET is 4.5mS, $R_D = 50\Omega$, $R_G = 200$ kΩ, $L=1$**nH** and the two coupling capacitors C_B are large, to provide almost a short circuit for the signal. Find the values of the remaining components. (3M)

End of Questions