Ministry of Higher Education

Kafrelsheikh University **Faculty of Engineering**

Electrical Engineering Department

Electronics & Electrical Communications / 3rd year / Academic year (2020-2021)

Subject : Electronic Tests **Time** : 3 hours

Examiner : Dr. Amira El Attar **Full mark** : 85 Marks

Solve the following questions:-

Question One (30 Mark)

a) Determine the difference between passive and active filters then explain with drawing the different types of active filters.

b) Design a first-order low-pass filter to give a high cutoff frequency of f_o = 1kHz with a pass-band gain of 4. If the desired frequency is changed to f_n =1.5 kHz, calculate the new value of R_n.

c) Design a wide-band-pass filter with f_L =10kHz, f_H = 1MHz and a pass-band gain of K_{PB} = 16, then calculate the value of Q for the filter.

Question Two (30 Mark)

a) Determine the different ways of amplitude modulation, and explain how each of them results in different spectral characteristics for the transmitted signal.

b) Draw the Block diagram of a modulator used to generate a DSB-SC AM and a demodulator for DSB-SC AM signal.

c) Explain by drawing a comparison of FM and PM modulators.

Question Three (25 Mark)

a) Draw a Wien Bridge Oscillator circuit, then calculate the resonant frequency of it if the frequency adjustment elements R=51KΩ and C= 0.001μF.

b) Design a phase shift oscillator using an FET having g_m = 5000 μS, r_d = 40 KΩ, and a feedback circuit value R=10kΩ. Select the value of C for oscillator operation at 1kHz and R_D for A> 29 to ensure oscillator action.

Best wishes

Dr. Amira El Attar