

Damietta University Faculty Of Science Physics Department



Year: 2019/2020 Experimental Physics Third year students (Physics)

- 1) Discuss the construction and operation of an Op-Amp.
- 2) Define the following terms:
 - Op Amp negative feed back.
 - Op Amp frequency bandwidth.
 - Op Amp differential mode.
- 3) Find the decimal and binary equivalents of the following numbers:
 - (125)₈
 - (1B4)₁₆
- 4) Find the decimal equivalent of the following numbers:
 - 11010110.01011
 - 0101110.100110
- 5) Find the equivalent circuit to the following Boolean expressions:
 - $X = \left[\overline{A \oplus B} \right] \cdot C + D$
 - $X=[A.B] \oplus \overline{C \oplus D}$
- 6) Draw and write the truth table for the following circuits:
 - Half adder.
 - Half subtractor.
 - Full subtractor.
- 7) Draw the following circuits and complete their corresponding truth tables:
 - A. RS flip-flop:

Input		Output	
S	R	Q	$ar{Q}$
0	0		
0	1		
1	0		
1	1		

B. D flip-flop:

Input		Output	
D	CLK	Q	$ar{Q}$
0	0		
1	0		
0	1		
1	1		

- 8) Discuss the construction of the 555 timer.
- 9) Discuss the operation of the 555 timer in a table mode.
- 10) Discuss the operation of the 555 timer in monostable mode.