Minia University
CSE Dept.
Electric circuits analysis

Midterm Exam 3, Time allowed: 1.5 Hrs
Name:_____
Date:_____

- ***This is a closed book exam.***
- ***The exam has 5 questions in two pages, answer all of them.***
- ***Good Luck!***

1. Find the total current in the load resistor R_L, in Figure 1. Assume the sources are ideal. ***[10 marks]***

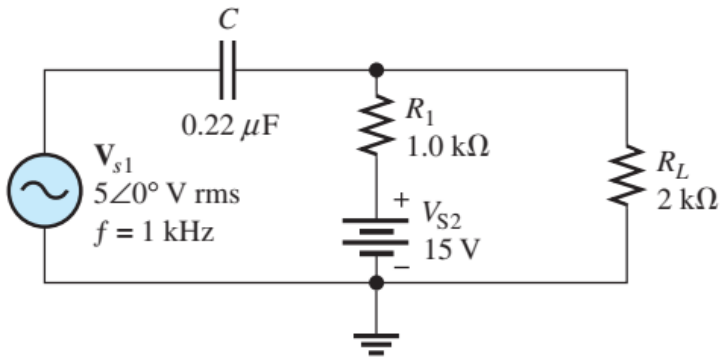

Figure 1

2. Determine the average power generated by each source and the average power absorbed by each passive element in the circuit of Figure 2. ***[10 marks]***

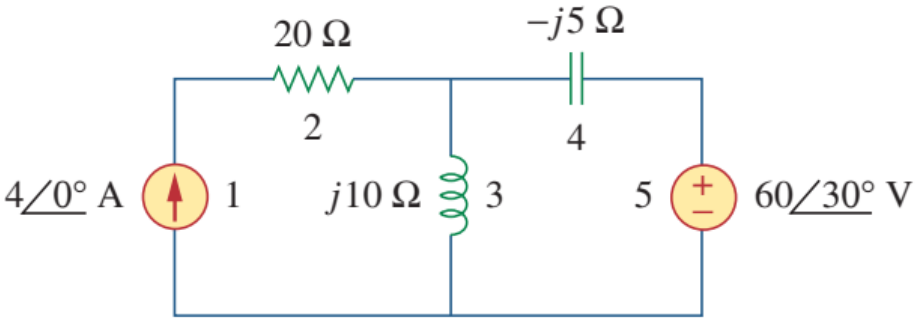

Figure 2

3. Determine $v_o(t)$ for the op amp circuit in Figure 3, if $v_s = 3\cos 1000t$ V. ***[10 marks]***

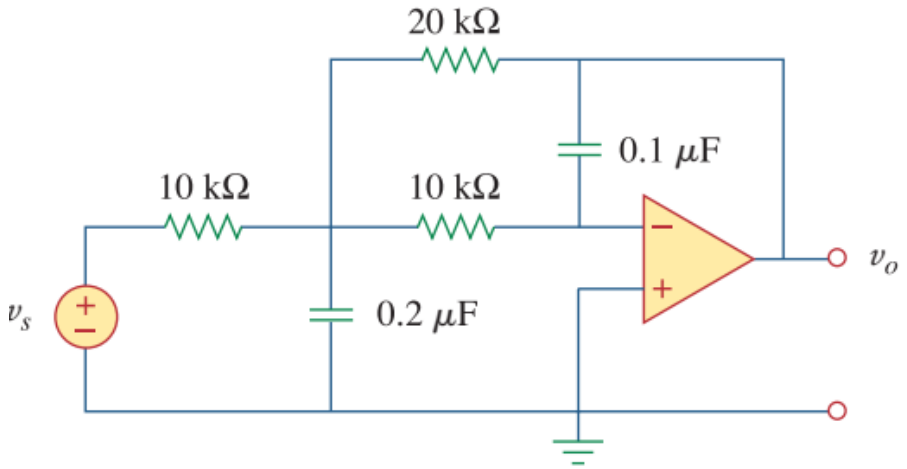

Figure 3

4. Determine the output voltage magnitude at the center frequency (f_0) and the bandwidth for the filter in Figure 4. ***[10 marks]***

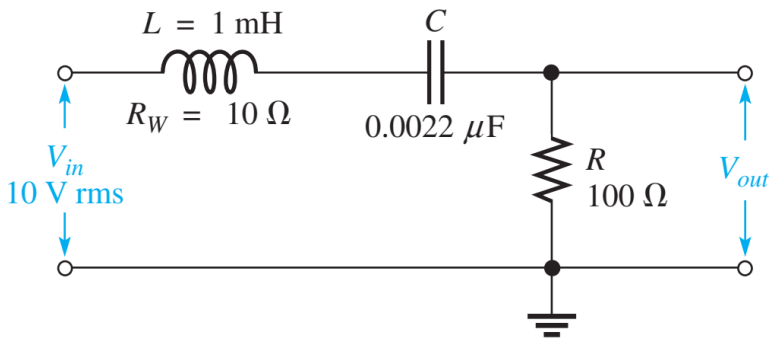

Figure 4

5. <u>Complete the following sentences</u>: ***[10 marks]***

i. At the critical frequency, the output of a filter is down from its maximum by ……...

ii. AC is more easily distributed than DC. This is because ……..

iii. When the load on an ac source contains only resistance, the current and voltage are ……..

iv. If a sine wave has a RMS voltage of 12 volts, its Peak-to-Peak voltage will be ……...

v. The inductive reactance of a 20-mH inductor at a frequency of 60 Hz is ……...

vi. For a certain load, the true power is 10 W and the reactive power is 10 VAR. The apparent power is ……...

vii. The filter that can be used to select a signal of one particular radio station is ……...

viii. The impedance of a capacitor increases with ……...

ix. An ideal operational amplifier has ……... and ……...

x. The quality factor (Q) is the ratio of ……...