ENGG104 Tutorial 6 extra Problems (revision)
(Solutions)

Name_____   Student Number_____

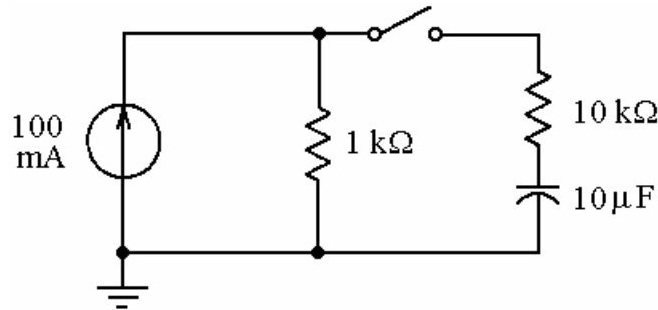**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

Figure 10.7

1) See Figure 10.7. After the switch closes, what is the final voltage reached across the 10 µF   1) _____
capacitor?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

2) Which of the following describes the action of a capacitor?   2) _____
   A) Converts ac into dc   B) Creates a dc resistance
   C) Opposes changes in the flow of current   D) Stores electrical energy

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

3) A capacitor has a capacitance of 1 farad if 1 coulomb of charge is deposited on the plates by a   3) _____
potential difference of 1 volt across the plates.

4) When breakdown occurs in a capacitor, the capacitor will display the same characteristics as an   4) _____
open circuit.

5) Similar to resistors, when you want to increase capacitance, you would connect them in series.   5) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

6) What is the charge on a 500 pF capacitor with 50 volts applied?   6) _____
      A) 2.5 nC   B) .025 C   C) 25 nC   D) .25 nC

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

7) What is the time constant of a network that contains a 1 microfarad capacitor in series with   7) _____
a 1 Kilohm resistor?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

8) Which type of capacitor is used in applications requiring several thousand microfarads of capacitance?   8) _____
   A) electrolytic   B) polyester   C) ceramic   D) mica

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

9) The ideal capacitor completely dissipates all energy supplied to it.   9) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.
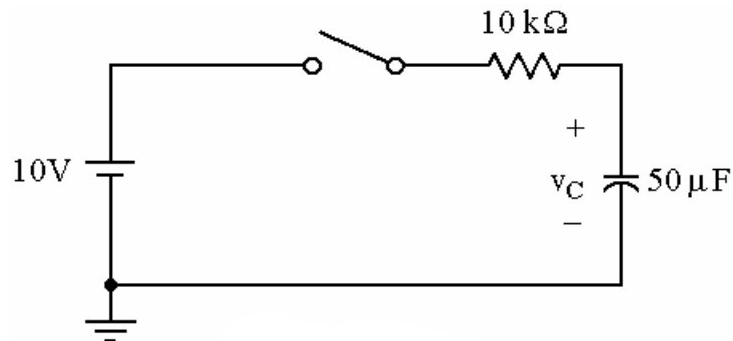

Figure 10.1

10) See Figure 10.1. If the initial voltage of the capacitor = 0V, what is the maximum instantaneous current that will flow through the capacitor after the closing of the switch?   10) _____
    A) 1 mA   B) 200 kA   C) 5 µA   D) infinity

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

11) Permittivity is measured in farads per meter.   11) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

12) How long will it take for a 2.2 µF capacitor to charge when connected in series with a 820 ohm resistor to a 25 volt source?   12) _____
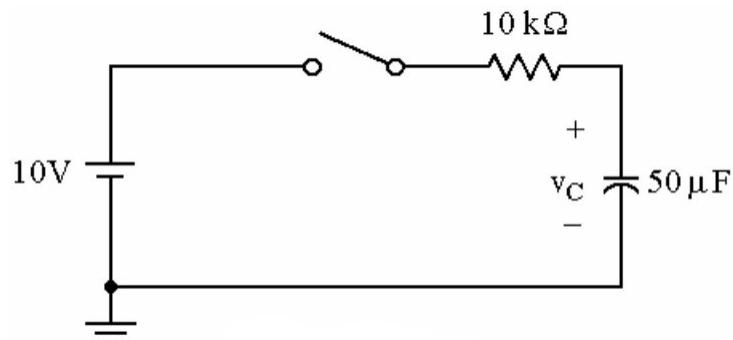   A) 1.8 ms   B) 18 ms   C) 180 ms   D) .18 ms

Figure 10.1

13) See Figure 10.1. What is the time constant t for this circuit?   13) _____
    A) 5 ms   B) 50 ms   C) 5 s   D) 500 ms

2

14) Two capacitors are placed in series, what is their equivalent capacitance if the value of one capacitor is 1 microfarad and the value of the other capacitor is 3 microfarads?   14) _____
   A) 75 microfarads   B) 0.75 millifarads
   C) 0.75 microfarads   D) 7.5 microfarads

15) What is the capacitance of a capacitor if 10 µC of charge are present when 100 V are applied across its plates?   15) _____
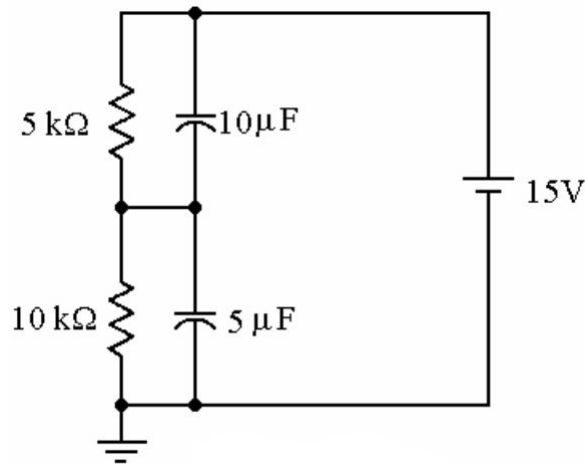   A) 10^7 µF   B) 10 µF   C) 1000 µF   D) 0.1 µF

Figure 10.5

16) See Figure 10.5. What is the voltage across the 5 µF capacitor after each capacitor has charged to its final value?   16) _____
   A) 0 V   B) 5 V   C) 15 V   D) 10 V

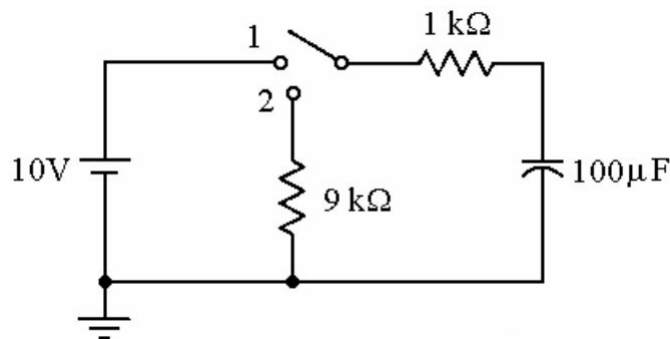**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

Figure 10.8

17) See Figure 10.8. Assume that the capacitor has charged to $v_C = 6$ V. How long will it take for the capacitor to discharge to $v_C = 4$ V after the switch is thrown to position 2?   17) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

18) What is the total capacitance of three capacitors connected in parallel with values of 2.2 µF, 6 µF and 3.2 µF?   18) _____
   A) .107 µF   B) 114 µF   C) 11.4 µF   D) 1.07 µF

3

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

19) The insulating material between the capacitor plates is called a conductor.   19) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

20) What is the value of a capacitor with 250 volts applied and 500 pC of charge?   20) _____
    A) 2 pF   B) 200 μF   C) .5 pF   D) 500 μF

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

21) An ideal capacitor looks like an open circuit to dc current once it has charged to its final value.   21) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

22) The type of capacitance that results not by design, but because two conducting surfaces are in close   22) _____
proximity to each other is called
    A) variable capacitance.   B) stray capacitance.
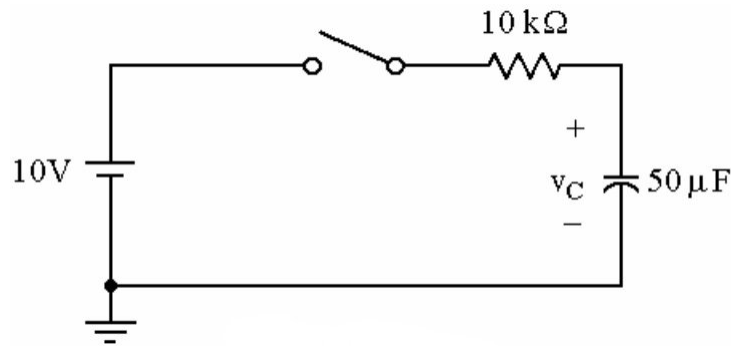   C) electrolytic capacitance.   D) tantalum capacitance.

Figure 10.1

23) See Figure 10.1. The voltage v_C will reach 99% of its maximum value after how much time has   23) _____
elapsed?
    A) 1 time constant   B) 5 time constants
    C) 50 time constants   D) 50 μs

24) What is the total capacitance of three capacitors connected in series with values of 2.2 μF, 6 μF and   24) _____
3.2 μF?
    A) 1.07 μF   B) .107 μF   C) .92 μF   D) 11.4 μF

1) 100 V
2) D
3) TRUE
4) FALSE
5) FALSE
6) C
7) 1ms
8) A
9) FALSE
10) A
11) TRUE
12) B
13) D
14) C
15) D
16) D
17) 0.41 s
18) C
19) FALSE
20) A
21) TRUE
22) B
23) B
24) A