Title: **RC Circuits** Test: 16

Course: Electrical Applications Unit: Electrical Theory CLO: 3

Name ANSWER KEY Grade 48pts. Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall identify specific characteristics of both RC series circuits and RC parallel circuits.
2. Student shall calculate various inductive reactance, phase angle and power factor quantities based on given information for both series and parallel RC circuits.

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Test. Grading shall be based on an answer key.

**Instructions**

Select the best answer to each multiple-choice question below.

1. A capacitor resists changes in:
   1. Reactance
   2. Voltage
   3. Current
2. Which of the following effects the reactance of an AC circuit?
   1. Voltage
   2. Current
   3. Frequency
3. The total impedance of a RC series circuit is equal to :
4. If the frequency of a RC parallel circuit is raised, the capacitive reactance will:
   1. Increase
   2. Stay the same
   3. Decrease
5. A parallel RC circuit’s reactive power can be calculated by the following.
6. Impedance is the total opposition to the flow of AC current in a circuit.
   1. True
   2. False
7. If the frequency applied to an RC parallel circuit increases the phase angle will:
   1. Increase
   2. Decrease
   3. Stay the same
8. One way to increase the power factor of a parallel RC circuit is to:
   1. Decrease the source voltage
   2. Increase the value of resistance.
   3. Increase the frequency.
9. If the frequency of an RC circuit is reduced, the circuit impedance:
   1. Increase
   2. Decreases
   3. Stay the same
10. The phase relationship between current and voltage in a capacitive-resistive circuit is?
11. Voltage and current will be in phase
12. Current will lead the Voltage.
13. Voltage will lead the current
14. A parallel RC circuit has the following current readings, the resistive branch measures 20 mA, the total current measures 30mA. The capacitive current would be.
15. 22.36mA
16. 27.3mA
17. 10mA
18. 50mA
19. A parallel RC Circuit has 6W and 3VArs. What is the power factor of the circuit?
20. 40.0%
21. 67.5%
22. 89.4%

**Circuit**



**Instructions**

Using the circuit and information above, complete the table below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | P/Q/S | | I | | R/X/Z | E |
| R1 | 47.685 | | 318.523mA | | 470Ω | 149.706V |
| C1 | 2.990 | | 318.523mA | | 29.473Ω | 9.388V |
| Total | 47.778 | | 318.523mA | | 470.923Ω | 150V |
| θ | 3.588 | PF | 0.998 |

1. Is there a phase shift between voltage and current in capacitor?
2. Yes
3. No
4. In a RC series circuit, as frequency increases the total current?
5. Increases
6. Decreases
7. Stays the same
8. In a RC series circuit, as the frequency decreases the power factor?
9. Increases
10. Decreases
11. Stays the same

**Circuit**



|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | P/Q/S | | I | | R/X/Z | E |
| R1 | 378.947mW | | 31.579mA | | 380Ω | 12V |
| C1 | 90.478mVAR | | 7.540mA | | 1.592kΩ | 12V |
| Total | 389.599mVA | | 32.467mA | | 369.611Ω | 12V |
| θ | 13.429˚ | PF | 0.973 |

1. Is there a phase shift between voltage and current in a resistor?
2. Yes
3. No
4. In a RC parallel circuit, as frequency increases the total current?
5. Increases
6. Decreases
7. Stays the same
8. In a RC parallel circuit, as the frequency decreases the power factor?
9. Increases
10. Decreases
11. Stays the same

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