Week 3: Assignment 3

Due at 2021-08-08, 23:59:59

1. a) Find the steady-state solution for the circuit shown in the diagram.

2. b) Verify that the solution in part a) satisfies the differential equation.

3. c) If the voltage source is replaced by a current source, what would be the new steady-state solution?

4. d) Calculate the voltage across the capacitor when the current source is replaced by a voltage source of 2V.

5. e) Determine the transient response of the circuit when the voltage source is replaced by a current source of 5A.

6. f) Sketch the voltage waveform across the capacitor for the circuit in part e).

7. g) If the voltage source is switched to a current source of 1A, what would be the new steady-state solution?

8. h) Calculate the voltage across the inductor when the current source is replaced by a voltage source of 3V.

9. i) Determine the transient response of the circuit when the current source is replaced by a voltage source of 4V.

10. j) Sketch the current waveform through the inductor for the circuit in part i).

11. k) If the voltage source is switched to a current source of 2A, what would be the new steady-state solution?

12. l) Calculate the voltage across the capacitor when the current source is replaced by a voltage source of 1V.

13. m) Determine the transient response of the circuit when the current source is replaced by a voltage source of 2V.

14. n) Sketch the voltage waveform across the capacitor for the circuit in part m).

15. o) If the voltage source is switched to a current source of 3A, what would be the new steady-state solution?

16. p) Calculate the voltage across the inductor when the current source is replaced by a voltage source of 4V.

17. q) Determine the transient response of the circuit when the current source is replaced by a voltage source of 5V.

18. r) Sketch the current waveform through the inductor for the circuit in part r).

19. s) If the voltage source is switched to a current source of 4A, what would be the new steady-state solution?

20. t) Calculate the voltage across the capacitor when the current source is replaced by a voltage source of 2V.

21. u) Determine the transient response of the circuit when the current source is replaced by a voltage source of 3V.

22. v) Sketch the voltage waveform across the capacitor for the circuit in part v).

23. w) If the voltage source is switched to a current source of 5A, what would be the new steady-state solution?

24. x) Calculate the voltage across the inductor when the current source is replaced by a voltage source of 6V.

25. y) Determine the transient response of the circuit when the current source is replaced by a voltage source of 7V.

26. z) Sketch the current waveform through the inductor for the circuit in part z).