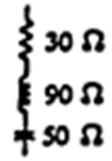
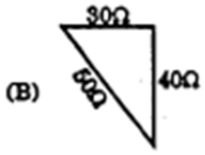
RECENT MORNING EIT PROBLEMS

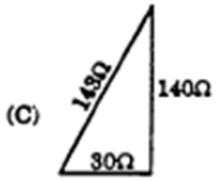
23.

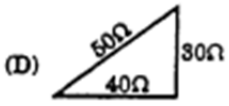


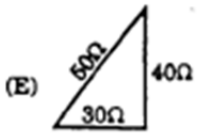
For the circuit element shown above, which of the following impedance diagrams is correct according to conventional notation?

(A) 

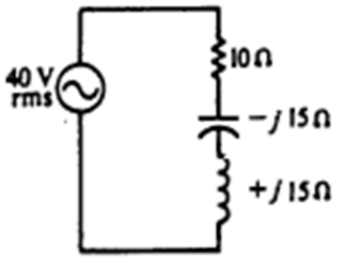
(B) 

(C) 

(D) 

(E) 

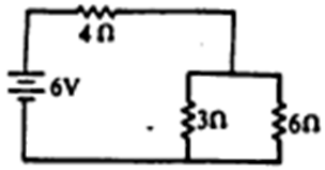
26.



What is the magnitude of the steady-state, root-mean-square voltage across the capacitor in the circuit shown above?

(A) 15 V
(B) 30 V
(C) 45 V
(D) 60 V
(E) 75 V

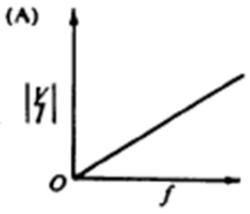
28.

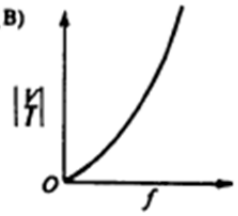


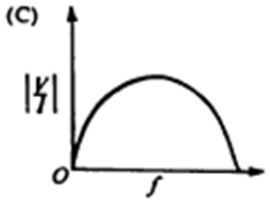
If the connecting wires and the battery in the circuit shown above have negligible resistance, the current through the 6-ohm resistor is most nearly:

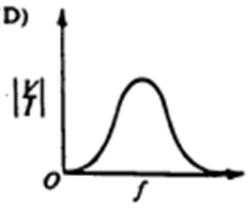
(A) $\frac{1}{10}$ A
(B) $\frac{1}{3}$ A
(C) $\frac{1}{2}$ A
(D) 1 A
(E) $\frac{3}{2}$ A

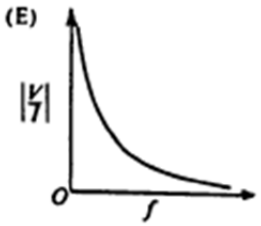
29. The ratio of root-mean-square (rms) voltage to rms current for a capacitor as a function of frequency f is shown by which of the following graphs?

(A) 

(B) 

(C) 

(D) 

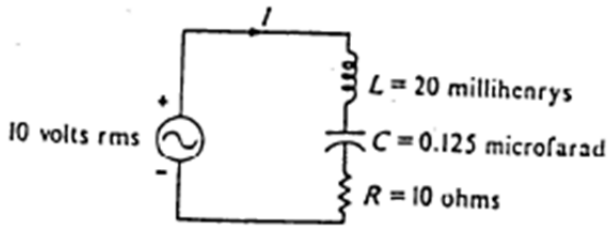
(E) 

ANSWERS TO MORNING PROBLEMS

23. E
26. D
28. B
29. E

RECENT AFTERNOON EIT PROBLEMS

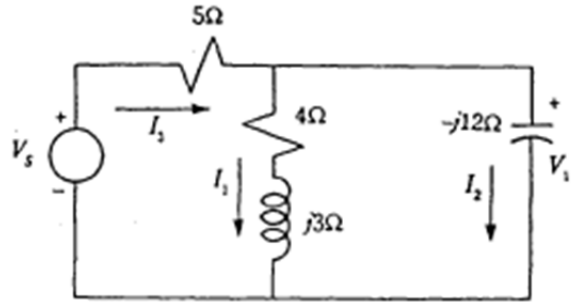
Questions 49–50 relate to the resistance-inductance-capacitance circuit shown below.



49. If the input is a variable frequency source, a series resonant condition will be established in the circuit when the source frequency is set at:
(A) 2,000 Hz
(B) 3,180 Hz
(C) 20,000 Hz
(D) 31,800 Hz
(E) 160,000 Hz

50. With the source frequency set at the series resonant value, the root-mean-square current in the circuit will be most nearly:
(A) 0.025 A
(B) 0.10 A
(C) 0.25 A
(D) 1.0 A
(E) 10 A

Questions 47–50 refer to the frequency domain representation of a circuit, as shown below. It is known that $I_1 = 14.4 \angle -36.9°$ and $I_2 = 6 \angle 90°$, expressed in RMS amperes.



47. The impedence seen by the voltage source V_s is most nearly:
(A) $9.5 \angle 18.4°$ Ω
(B) $10.0 \angle 36.9°$ Ω
(C) $10.7 \angle 16.0°$ Ω
(D) $11.0 \angle 7.1°$ Ω
(E) $15.0 \angle -53.1°$ Ω

48. The RMS phasor expression for the voltage V_1 is most nearly:
(A) $0.5 \angle 0°$ V
(B) $0.5 \angle 180°$ V
(C) $72 \angle 0°$ V
(D) $72 \angle 90°$ V
(E) $72 \angle 180°$ V

49. The RMS phasor expression for the current I_3 is most nearly:
(A) $10.3 \angle -32.5°$ A
(B) $11.8 \angle -13.0°$ A
(C) $18.6 \angle 51.9°$ A
(D) $18.6 \angle -51.9°$ A
(E) $20.4 \angle 53.1°$ A

50. The power dissipated by the 4-ohm resistor is most nearly:
(A) 415 W
(B) 829 W
(C) 1300 W
(D) 1660 W
(E) 2590 W

ANSWERS TO AFTERNOON PROBLEMS

49. B
50. D

47. D
48. C
49. B
50. B