

Unit 11 - Week 9

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Week 9 Assignment 9

The due date for submitting this assignment has passed. **Due on 2019-10-02, 23:59 IST.**
As per our records you have not submitted this assignment.

1) Consider a RLC series circuit connected across an ac voltage source V . If the frequency of the ac circuit is more than the resonant frequency, then the circuit voltage V

- is in phase with the circuit current I
- leads the circuit current I
- lags the circuit current I
- None of the above.

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

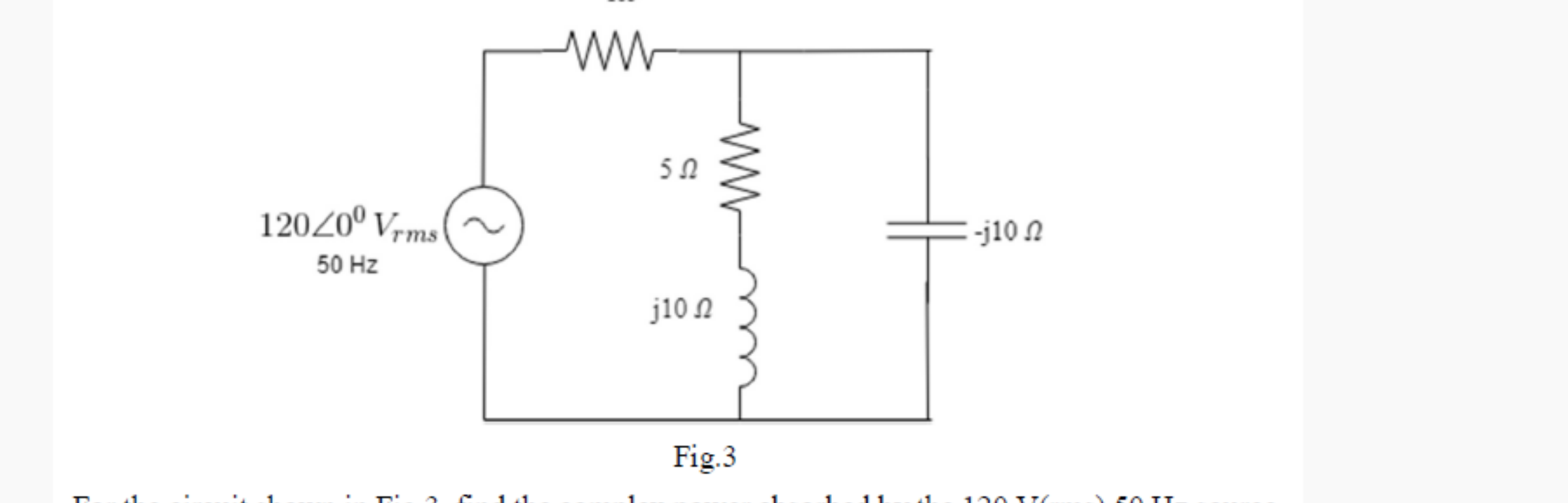
2) A single-phase source of 230 V rms is supplying three loads in parallel: (i) 1.2 kVA at a lagging power factor of 0.8, (ii) 1.6 kVA at lagging power factor of 0.9, (iii) 900 W at unity power factor. Find the power factor at which the source is operating.

- 0.9180 (lagging) – 0.9190 (lagging)
- 0.9980 (lagging) – 0.9990 (lagging)
- 0.9350 (lagging) – 0.9360 (lagging)
- 0.9270 (lagging) – 0.9280 (lagging)

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.



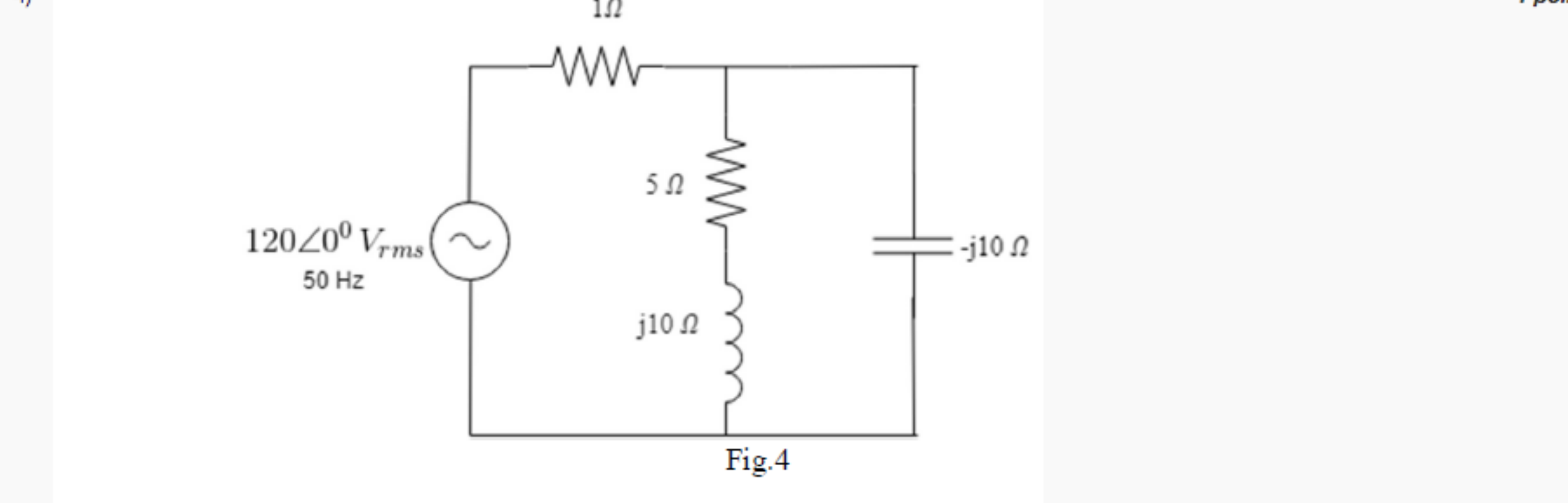
For the circuit shown in Fig.3, find the complex power absorbed by the 120 V(rms),50 Hz source.

- (532+j 1065) VA
- (-532- j1065) VA
- (-559 + j 266) VA
- (559 – j 266) VA

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.



For the circuit shown in Fig.4, find out the resonance frequency (in Hz).

- 41.50 - 41.70
- 43.20 – 43.40
- 269.9 – 270.1
- None of the above

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

5) In a series RLC circuit, the upper and lower cut-off frequencies are 200 rad/s and 50 rad/s respectively. It is known that the value of the inductance is 10mH. Find out the value of the capacitance. Assume the inductor and the capacitor to be ideal.

- 1 F
- 100 mF
- 10 μF
- 10 mF

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.

6) A series RLC circuit has 10Ω resistance, 60 mH inductance and an unknown capacitance. At a frequency of 25 Hz, it is observed that the circuit current leads the applied voltage by 25°. At what frequency (in rad/s), the circuit will be resonant?

- 190 – 193
- 170 - 173
- 110 - 113
- None of the above

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

7) Determine the amplitude of the line current (in A) in a three-phase system with a line voltage of 300 V that supplies 1200 W to a Δ-connected load at a lagging power factor of 0.8.

- 1.65 – 1.68
- 2.29 – 2.32
- 2.87 – 2.90
- 4.99 – 5.02

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

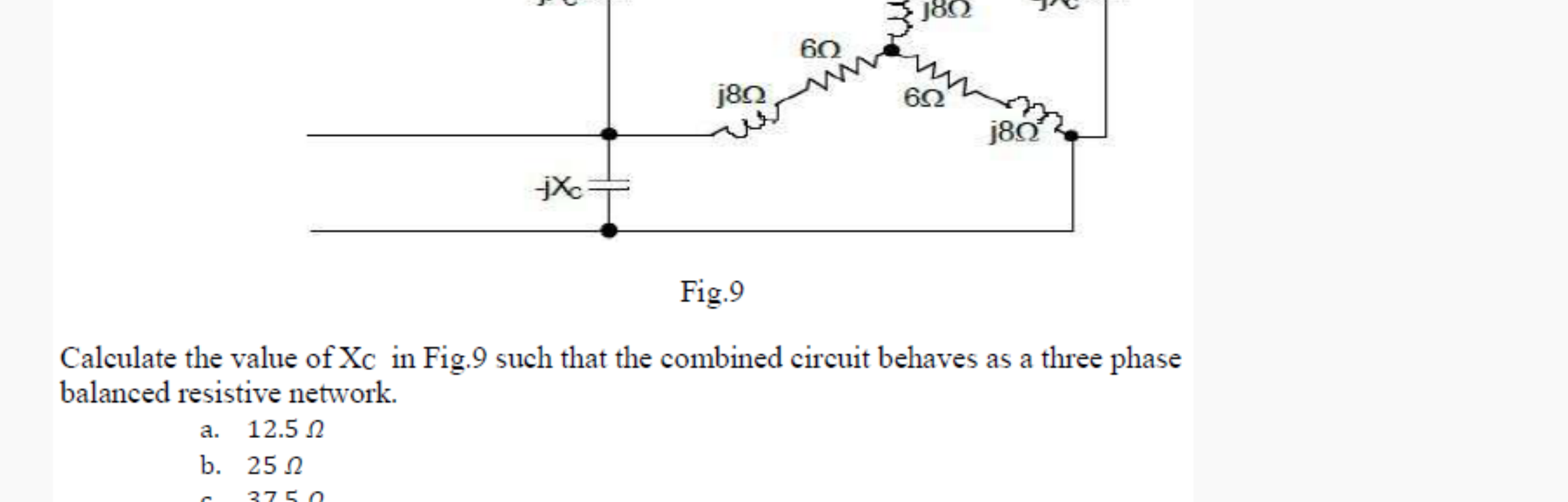
8) Determine the per phase impedance (in Ω) of a three-phase system with a line voltage of 300 V that supplies 1200 W to a Δ-connected load at a lagging power factor of 0.8.

- 103.92 ∠-36.87°
- 103.92 ∠36.87°
- 180.00 ∠-36.87°
- 180.00 ∠36.87°

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.



Calculate the value of X_c in Fig.9 such that the combined circuit behaves as a three phase balanced resistive network.

- 12.5 Ω
- 25 Ω
- 37.5 Ω
- 75 Ω

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

10) A balanced three-phase three-wire system is terminated with two Δ-connected loads in parallel. Load 1 draws 40 kVA at a lagging power factor of 0.8, while load 2 absorbs 24 kW at a lagging power factor of 0.9. Assume no line resistance and let $V_{ab} = 440 \angle 30^\circ$ V. Assume a-b-c phase sequence. Find out the line current (in Ampere) of phase-A (I_{LA}). [Assume that the source side quantities are denoted by small letters (i.e. a, b, c) and the quantities at the load end are denoted by capital letters (i.e. A, B, C)]

- 75.254∠ - 12.46° Amp
- 75.254∠12.46° Amp
- 43.448∠-12.46° Amp
- 43.448∠12.46° Amp

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a.

11) A 400V, 50 Hz, balanced three-phase three-wire system has a Y-connected load. Each phase contains three loads in parallel: -j100Ω, 100Ω and (50+j50)Ω. Assume positive phase sequence. Find the total power (in W) drawn by the load.

- 940
- 1067
- 3200
- 9600

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
c.

12) Three identical resistive loads are connected in star across a balanced 3-phase voltage source. If load in one of the phase is removed, find out the percentage reduction in the total output real power.

- 25%
- 33.33%
- 66.67%
- None of the above

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d.