

Standard Licence Review Questions

These questions refer to the sections identified in the syllabus.

Section 4.1 Mains power Refer to [WIA MEMBER ARMAG 2021 5 Sept Oct.pdf \(julesworkshop.net\)](#)

1. What is the frequency of mains power in Australia?
2. Identify the pins on the 3-pin plug.



3. Complete the following table. What voltages would you expect when measuring between the following points?

Active and earth	
Active and neutral	
Neutral and earth.	

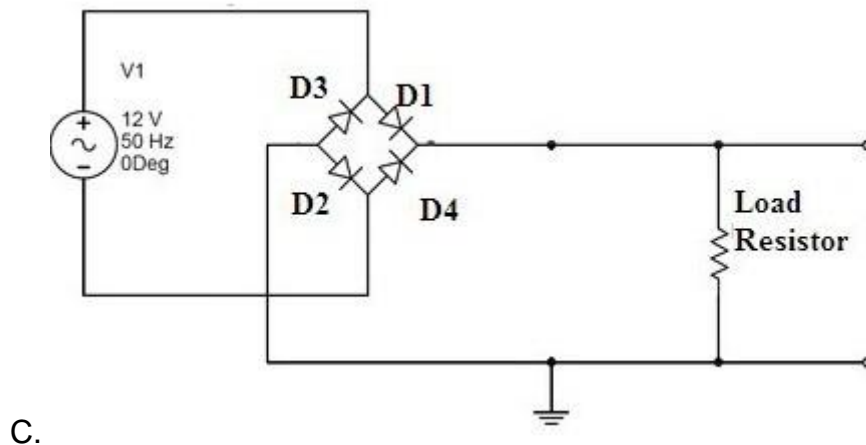
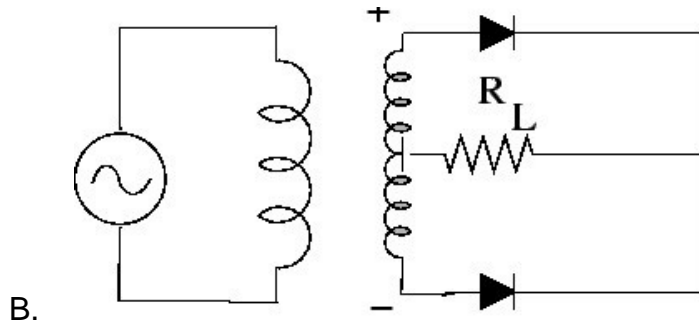
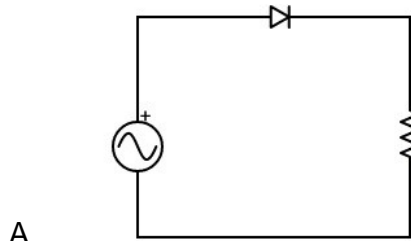
4. 240v lead wiring colours changed. What are the current wiring colours?

	Old colours	New colours
Active	Red	
Neutral	Black	
Earth	Green	

5. What is the purpose of having an earth pin on the plug?
6. How does a fuse work?
7. What is the equipment that is replacing fuses on mains power and how do they work?
8. On which lead would the isolation switch be included and why?

4.2 - 3 Mains Power Supplies

1. Describe the operation and purpose of the following circuits. What would the output across the load look like with these circuits?



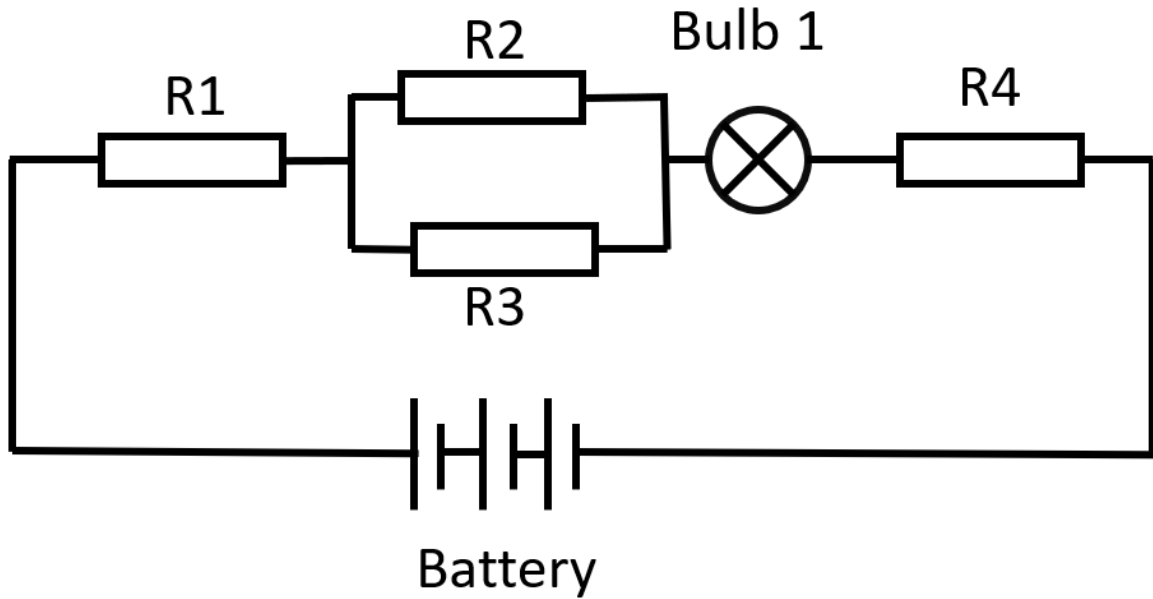
2. What is Peak Inverse Voltage (PIV) and how does it apply to the circuits above?

4.4 Voltage and Current Refer to [Article Ohms Law.pdf \(julesworkshop.net\)](http://julesworkshop.net/Article%20Ohms%20Law.pdf)

1. Describe voltage and how is it measured?
2. Describe current and how is it measured?
3. What is the relationship between the two?
4. What is the formulae for this relationship?
5. Explain "potential difference".

4.5-6 Resistance Refer to [Article Ohms Law.pdf \(julesworkshop.net\)](http://julesworkshop.net/Article%20Ohms%20Law.pdf)

1. What is resistance and how is it measured?
2. Complete the following table using the diagram below as reference.



Calculate the total with the values of R2 and R3 in the following combinations.

R2	R3	Total R2/R3
100Ω	100Ω	
200Ω	100Ω	
50Ω	1000Ω	
66Ω	33Ω	

Calculate the total resistance with the values in the following combinations.

R1	R2/R3	Bulb	R4	Total
100 Ω	100 Ω	15 Ω	100 Ω	
6 Ω	10 Ω	5 Ω	100 Ω	
2K Ω	1.5K Ω	100 Ω	500 Ω	
1M Ω	2M Ω	100 Ω	6m Ω	

Complete the table assuming the following values.

Battery	Current	R1	R2	R3	Bulb	R4
90v	3A	6Ω	20Ω	202Ω	Ω	4Ω
12v	A	20 Ω	100 Ω	100 Ω	15 Ω	10 Ω
60v	2A	100 Ω	Ω	Ω	15 Ω	1000 Ω

Big, beautiful roses occupy your gardens, but violets grow wild.
 Black, Brown Red Orange Yellow Green Blue Violet Grey White
 This is a rhyme to remember the resistor colour bands.

Complete the following table.

Band 1	Band 2	Band 3	Band 4	Value	Tolerance
Black	Brown	Red	Gold		
				1MΩ	2%
Green	Blue	Yellow	Red		
Orange	Black	Brown	Silver		

4.7 Ohms Law

Addressed in 4.4 and 4.5.

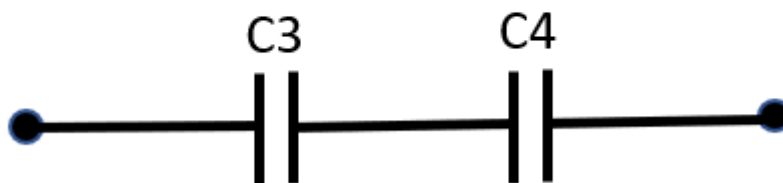
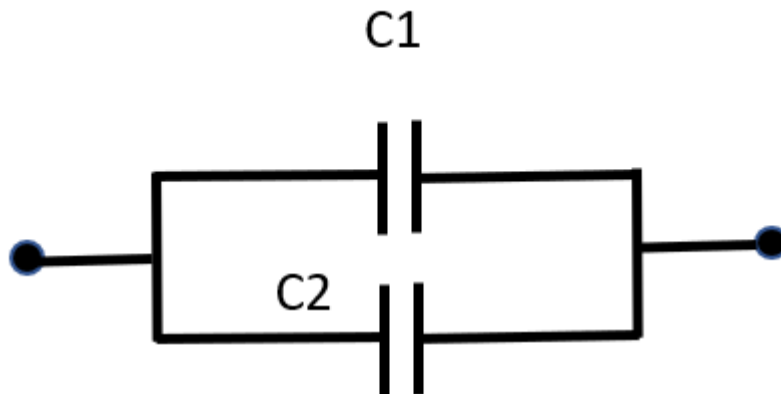
4.8 Power in DC circuits

Complete the following table.

Voltage	Current	Resistance	Power
12v	0.5A		
12v		15Ω	
	3A		100W

4.9-12 Capacitance

- Describe a capacitor and the unit of measurement.
- What is a dielectric?
- What are the four characteristics that define the capacitor?
- What is the capacitor breakdown voltage and how does this define the use of the capacitor?
- What does a “polarised” capacitor mean and what precautions are needed?
- What precautions should you take with large or high voltage capacitors?
- Calculate the capacitance in the following circuits.

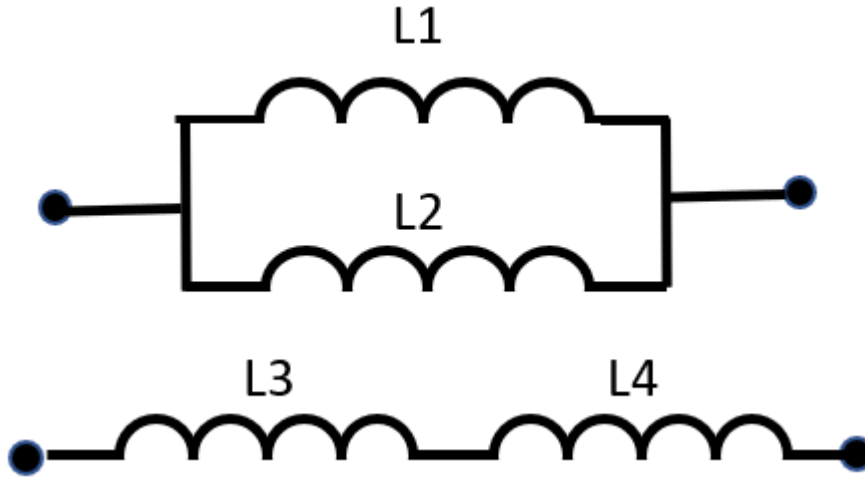


C1	C2	C3	C4	Total
10pF	65pF			
33nF	32pF			
66nF	66nF			
		10pF	65pF	
		33nF	32pF	
		66nF	66nF	

4.13 – 15 Inductance

- Describe an inductor and the unit of measurement.

- Describe the critical characteristics of an inductor if you were making one.
- How does an inductor store energy?
- If you increase the turns coil diameter and spacing, does the inductance increase or decrease?
- Complete the following table with regards to the drawings below.



L1	L2	L3	L4	Total
6uH	6uH			
33nH	32pH			
660uF	66uF			
		6uH	6uH	
		33nH	32pH	
		660uF	66uF	

4.16 – 18 AC Circuits

- What is the Root Mean Square (RMS)?
- Draw a sine wave and show where the RMS value would be.
- What is the DC equivalent of the RMS value?
- What is the period and formulae of a sine wave?
- What is frequency measured in and what is the relationship to the period?
- Draw a sine wave with time on the X axis and degrees in the Y axis.

4.19 – 20 Impedance and reactance Refer to [Article Resonant Circuits.pdf \(julesworkshop.net\)](http://julesworkshop.net)

- What is the reactance?
- What is impedance?
- How is impedance and reactance related?

4.21 – 23 Tuned circuits Refer to [Article Resonant Circuits.pdf \(julesworkshop.net\)](http://julesworkshop.net)

- If $X_L = X_C$, describe the tuned circuit.
- What is Q when referring to tuned circuits?
- What is the impedance of a series tuned circuit at resonance?
- What is the impedance of a parallel tuned circuit at resonance?
- Draw a parallel tuned circuit with capacitance, inductance and resistance.
- Draw a series tuned circuit with capacitance, inductance and resistance.

4.24 – 26 Transformers

1. What is a transformer and how does it work?
2. What is Faraday's law of induction?
3. Explain the following terms
 - Voltage ratio
 - Turns ratio
 - Current ratio
4. What are eddy currents and what effect do they have on transformers?

4.27 – 31 Solid state Devices Refer to [Diodes - The non return valves in electronics.pdf \(julesworkshop.net\)](#) and [Bipolar Transistors.pdf \(julesworkshop.net\)](#)

1. What is the forward voltage drop across a diode?
2. Why does this happen?
3. What is a Zener diode and how is it used?
4. What is a varicap and how is it used?
5. Draw the following symbols and identify the legs of the devices.
 - NPN transistor
 - PNP transistor
 - FET
6. What are the operational characteristics of each of these devices?
7. Draw a common emitter/source configuration using each of the devices in No 5.
8. What is the use of the common emitter/source configuration?