Ohms Law

1. A copper cable is 45m long and has a CSA of 4mm 2 . Calculate its resistance.
2. A copper cable has a resistance of 0.6Q and a CSA of 6mm 2 . Calculate its length.
3. A copper cable has a resistance of 0.8Q and is 55m long. Calculate the CSA.
4. A motor has a resistance of 28Q and is connected to a single phase supply. Calculate the current in the circuit.
5. A light draws 4A from a supply and has a resistance of 20Q. Calculate the supply voltage.
6. A fan is connected to a single phase supply and draws 0.7A. Calculate its resistance.
7. A cable is connected to a motor with a single phase supply, has a resistance of 0.45Q and 4 amps are flowing in the cable. Calculate the volt drop across the cable. What would be the voltage at the motor?
8. Three lights are connected in a radial circuit, the resistance of each lamp is 450. Calculate the current in the circuit if it is connected to a single phase supply.
9. A motor draws 16A from a single phase supply. A few weeks later the motor circuit fails and I need to investigate. If I conducted a continuity test on the motor what reading would I expect?
10. You conduct a continuity test on the line conductor and obtain a reading of 0.72Q. The cable is connected to a single phase supply with 12A flowing. Calculate the volt drop across the cable.
11. Three resistors are connected in series to a 100v supply. Their values are 14, 18 and 25 ohms.

Draw the circuit then calculate the total resistance, total current, volt drop across each resistor, power dissipated in each resistor and total power dissipated by the circuit.

12. Three resistors are connected in parallel to a 150v supply, their values are 55, 40 & 20 ohms.

Draw the circuit then calculate the total resistance, total current, current in each branch, power dissipated in each resistor and total power dissipated by the circuit.

1. Three resistors are connected in series to a 350v supply, the volt drop across RI and R3 is 50v. Calculate the volt drop across RI.
2. A motor has a resistance of 35Q and is connected to a 230v supply. Calculate the power dissipated.
3. Another 35Q motor draws 50A from a supply. Calculate the power dissipated.
4. A lamp is connected to a 400v supply and has a resistance of 750, calculate the power dissipated.
5. A fridge has a power rating of 2.5Kw when connected to a 230v supply, calculate the current drawn from the supply.
6. A welder is rated at 50Kw and draws 300A on full load, calculate the supply voltage.

19. A play-station draws 500mA from a 230v supply, calculate the power dissipated.

**Parallel Circuits Level 2**

20. Three resistors are connected in parallel; there values are 137Q, IOOQ and 67Q. Calculate the total resistance.

Formula Working

Answer

21. The same three resistors listed above are connected in parallel to a 400v dc supply; calculate the branch currents and total current drawn from the supply.

Formula Working Answer

Formula Working Answer

Formula Working

Answer

22. A parallel circuit has a total resistance of 47Q, the total current flowing in the circuit is 3.5A. Calculate the supply voltage.

Formula

Working

Answer

23. A parallel circuit consists of 3 resistors, their values are 67Q, 35Q & 200Q respectively. Calculate the following:

Total resistance

Formula

Working

Answer

Total current

Formula

Working

Answer

Current in each branch

Formula

Working

Answer

Formula

Working

Answer

24. A parallel circuit contains three resistors and draws 56A from a supply. The current in branch 1 is 14A and 23A flows in branch 3. Calculate the current in branch 2.

Formula

Working

Answer

25. Four identical 65Q fluorescent lights are connected to a 230v supply. Calculate the total current drawn from the supply.

Formula Working Answer

Formula Working

Answer

26. Three lamps are connected in parallel, lamps 1 & 3 draw 1.54A with lamp 2 drawing 2.5A. Calculate the current drawn from the supply.

Formula

Working

Answer

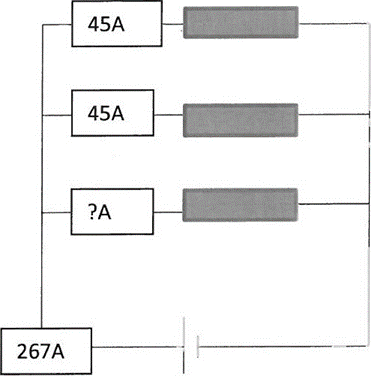
27. Three heaters are connected in parallel; the current drawn from the supply is 125A. Heaters 2 & 3 draw 45a each, how much current is heater 1 drawing from the supply.

Formula

Working

Answer

28. Calculate the missing current.



Formula

Working

Answer

29. Complete the table below

|  |  |  |  |
| --- | --- | --- | --- |
| RI |  | R3 |  |
| 600 | 660 |  | 180 |
| IOOQ |  | IOOQ | 270 |
|  | 400Q | 3500 | 1550 |
| 1800 | 1500 |  | 690 |
| 1250 |  | 900 | 350 |

Well done! You have cracked parallel circuits using Ohms law!

**Basic Mechanics**

30. An object has a mass of 60KG and accelerates at 6ms-2. Calculate the force on the object

31. A car accelerates at 20ms- , the driver experiences a force of 1250N. Calculate the drivers mass.

32. A bucket is filled with cement and has a mass of 6KG, calculate its weight.

33. A force of 25N moves an object through a distance of 4m, calculate the work done.

34. 2.2KJ of work is done by an object that has moved 120m. Calculate the force.

35. A crane does 5KJ of work in 1.5minutes. Calculate the power required.

36. A pallet of bricks has a mass of 200KG and is lifted 6m in 45s. Calculate the work done and the power rating of the motor.

37. A motor requires 6KW of input to produce 5KW of output, calculate the efficiency of the motor.

38. A machine is 93% efficient and produces an output of 27KW. Calculate the input.

39. A waste disposal unit has an output of 12KW and is 78% efficient, calculate the input.

40. A crowbar has a handle that is 1.8m long and I exert a force of 20N on it. A box is then placed 25cm from the fulcrum, what is the maximum weight force I can lift?

41. A pair of pliers has handles that are 18cm long. I place a cable 1.5cm from the fulcrum that requires 75N to cut it. How much force do I need to exert in order to cut the cable?

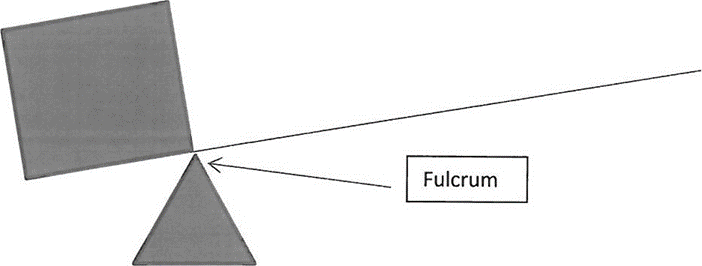
42. A cable is 68m long and has a cross sectional area of 2.5mm2. Calculate the resistance of the cable assuming the resistivity of copper is 1.67x10 8

43. A copper cable has a resistance of 0.850 and a CSA of 4mm2. Calculate the length of the cable.

44. A current of 25A passes through a cable that has a resistance of 0.920. Calculate the power dissipated by the cable.

45. A cable has a resistance of 1.2Q and has a volt drop of 3.8v across it. Calculate the power dissipated in the cable.

46. Draw a diagram to show how voltmeters and ammeters are connected into a series circuit containing three resistors.



47.

The box weighs 150N and is 50cm from the fulcrum. The handle is 300cm long, how much effort is required to lift the box?

A lever has a handle that is 2.4m long and I press down with an effort of 20N. A box is placed 0.3m from the fulcrum, how heavy is the box?

A pair of pliers has handles that are 25cm long and I squeeze with a force of 50N. A cable takes 400N of force to cut it, how far does it need to be from the fulcrum?

48. A conductor has a resistance of 1.2 ohms. The length is quadrupled and the csa is doubled, what is it new value of resistance?

49. How much force is required to produce a torque of 20 Nm if a lever is 1.2 metres long?

50. An object has a mass of 60Kg calculate is weight force.

51. An ac supply has a frequency of 60Hz, calculate the periodic time.

52. A sine wave has a periodic time of 22 micro seconds, calculate its frequency.

53. A sine wave has a peak value of 500v, calculate its RMS value.

54. 5KJ of work is done by a force of 65N. Calculate the distance covered.

55. Describe how electricity is generated.

56. Draw a three phase sine wave.

57. A motor draws 45KW from the supply and is 79% efficient, calculate the output.

58. A motor outputs 750W and is 93% efficient, calculate the input.

59. A mass of 15Kg is to me moved 6m on a conveyor belt in 5 seconds, calculate the power output of the motor. (There are 3 stages to this calculation).

60. Define voltage, current and resistance.

61. An object has a weight of 56N and is moved through a distance of 88m. Calculate the work done.

62. Write out the formulas for velocity ratio and mechanical advantage.

63. A battery is charged with a current of 5.6A for 1.5 hours. Calculate the quantity of electricity.

64. Seven thousand joules of work is done in 15 minutes. Calculate the power.

65. A cable is made of copper and is 67m long, the CSA is 1.5mm2. Calculate the resistance of the cable.

66. A copper cable has a resistance of 0.25Q and is 125m long. Calculate the CSA of the cable.

67. Three resistors are connected in series to a 56v supply. There values are 50, 160 and 1.3KQ. Calculate the current taken by the circuit and express your answer as a whole number, and in mill amps.

68. The three resistors above are connected in parallel to the same supply; calculate the current taken by the circuit.

69. Write out as many formulas and units as you can.

70. Write out the following in exponential format:

0.021 0.000067 2387 2500000 0.000000005

71. Frequency Power Work done Torque Force Resistance Current Magnetic flux

72. How much force is required to move an object of mass 45Kg through a distance of 16m?

73. Spanner is 43cm long and a force of 20N is applied to the spanner. How much torque is generated?

74. If 120Nm of torque is generated by a force of 20N how long is the spanner?

75. 1500 Joules are used in 45 seconds; how much power is being generated?

76. If 35KW of power is generated in 5 minutes how much work is being done?

77. A motor has an efficiency of 92% and the output is 75KW. Calculate the input.

78. If a motor can output 155KW with an input of 175KW, what is the efficiency of the motor?

79. Calculate the weight of a body of 50kg when subjected to the Earth’s gravity of 9.81m/s2.

**Electro-Magnetism**

F = BIL

Ernf = BLV

80. A 4m long conductor is placed at right angles to a magnetic field. The force experienced by the conductor is 28N with a current of 6A flowing. Calculate the flux density.

81. An emf of 500v is produced by a 3m conductor cutting a flux of 6T. Calculate the velocity.

82. A conductor has a current of 8A flowing in it, it is adjacent to a magnetic field of 57mT and experiences a force of 200N. Calculate the length of the conductor.

83. A conductor is moved at 3 ms-I through a magnetic flux of 3T. The emf produced is 230v, calculate the length of the conductor.

84. A 6m cable with 3A flowing is placed at right angles to a 6T magnetic field. Calculate the force on the conductor.

85. A generator has a coil 22m long, it is rotated at 48 ms-I and cuts through a magnetic flux of 6T. Calculate the emf generated.

**Basic Mechanics Revision**

F=mxa

Weight = m x g Gravity = 9 81

Wd = f x d

Power = wd/t

Electrical power = V x I

output

Efficiency = x 100 input

86. A motor has an input of 6KW and is 78% efficient. Calculate the output.

87. An air conditioning unit has an output of 4KW and is 88% efficient. Calculate the input.

88. A fridge has an input of 1.2KW and an output of 900W. Calculate the efficiency.

89. A mass of 65Kg experiences a force of 275N. Calculate the acceleration.

90. A force of 600N is created by an acceleration of 30ms-2. Calculate the mass.

91. A car has a mass of 500Kg, calculate its weight.

92. 2KJ of work is completed by a motor producing a force of 20N. Calculate the distance moved.

93. A distance of 4m is covered by a conveyor belt, the work done is 350J. Calculate the force produced by the motor driving the conveyor belt.

94. 20KW of power is produced in 6 Minutes by a concrete mixer. Calculate the work done.

95. 100KW of power is produced when a machine completes 1 MJ of work. Calculate the time taken.

96. An 18KW motor is connected to a 500v supply. Calculate the current drawn by the motor.

97. A compressor is connected to a single-phase supply and draws a current of 8A. Calculate the power of the motor.

Now for some tough stuff!

98. A car engine has a mass of 200Kg and has to be lifted 3m out of the chassis. The time taken is 25s.

Calculate the power

Assuming that the motor driving the hoist is single phase, calculate the current drawn by the motor.

The motor is 95% efficient, calculate the input required.

99. A pump is 75% efficient and it lifts 60 litres of water out of a well 12m deep in 1.5 minutes. Calculate the input to the motor.

**Levers Revision**

100. I have a pair of pliers; the handles are 12cm long. I exert a force of 16N onto the handles and this allows me to cut a cable that is 1.5cm from the fulcrum. How much force does it take to cut the cable?

101. A crowbar is used to open a wooden box, the force required to open the box is 120N and is applied 2cm from the fulcrum. The crowbar has a handle that is 40cm long, how much force will I need to use?

102. Two boxes are placed on a see saw, one box weighs 20N and the other weighs 55N. If the 20N box is placed 2m from the fulcrum, how for does the other box need to be from the fulcrum to balance?

103. I have lost my key to the padlock on my shed. Luckily I have some bolt croppers with 60cm handles. I can exert a force of 60N, if I place the lock 4cm from the fulcrum how much force can the croppers produce?

104. Give 3 examples of class 1 levers and one each for a class 2 and class 3 lever.

105. The resistivity of copper is 1.72Ω , calculate the resistance of a 60m cable with a CSA of 4mm2.

106. A 4mm2 copper cable has a resistance of 0.80Ω, calculate the length of the cable.

107. Two resistors are connected in parallel; their values are 15Ω and 20Ω respectively. The supply voltage is 50v. Draw the circuit and calculate the power dissipated in each resistor.

108. We need to measure the current drawn by a motor, draw a diagram and explain how you would connect the ammeter.

109. Three resistors are connected is series, draw a diagram and explain how you would position the volt meters to measure volt drop.

110. Draw a coil and show how you would determine which end is north and south.

111. With reference to an electro-magnet, how would you increase the magnetic flux?

112. Draw and label a sine wave, you must show amplitude, peak to peak and periodic time.

113. A sine wave has a periodic time of 160gs, calculate the frequency.

114. A sine wave has a frequency of 5KHZ, calculate the periodic time.

115. How much power is required to raise a mass of 10Kg through 10m in 50s?

116. Describe the 3 effects of electrical current and give an example for each.

117. Draw a conductor showing current flowing away from you and the correct magnetic field.

118 Draw a conductor showing current flowing towards from you and the correct magnetic field.

119. Label the direction in which the conductor will be pushed.

In the diagram below indicate the direction of current induced into the conductor.

120. Draw two current carrying conductors where the current is flowing in the same direction. Indicate if they would attract or repel.

121. Draw two current carrying conductors where the current is flowing in opposing directions. Indicate if they would attract or repel.

122. A sine wave has a peak value of 680v, calculate the RMS value.

123. A sine wave has an RMS value of 300v, calculate the peak value.

124. A sine wave has a peak value of 500v, calculate the average value.

125. A sine wave has an average value of 800v, calculate the peak value.

126. Why do we normally use the RMS value and not the peak value?

1. Which is the correct formula to find I from the formula P =I2R?
2. Calculate the cosine of the following angle (a) in the figure below.

5

6.4

4

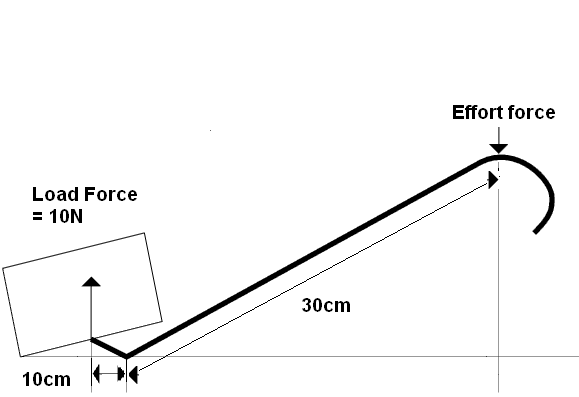
a

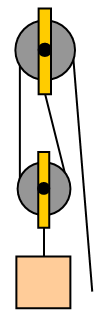
* 1. 37.5

6.4

* 1. 0.78
  2. 0.63
  3. 0.8

1. The SI unit for Impedance is? (L2.2)
   1. Watts
   2. Henrys
   3. Hertz
   4. Ohm’s
2. The electrical quantities symbol for Inductive Reactance is? (L2.2)
   1. W
   2. XL
   3. Y
   4. Z
3. Kelvin is the measurement of? (L2.1)
   1. Length
   2. Area
   3. Mass
   4. Temperature

1. Which instrument would be used to measure Power? (L2.3)
   1. Ohm meter
   2. Volt meter
   3. Watt meter
   4. Amp meter
2. The SI unit for Energy is the? (L2.2)
   1. Watts
   2. Joule
   3. Ohm
   4. Farad
3. A 25 kilogram bag of cement falls to the ground from a height of 5 meters. (L3.4)  
   How much force will the bag hit the ground with?
   1. 245.25N
   2. 5J
   3. 125N
   4. 196.2J
4. A wheel barrow is an example of a: (L3.2)
   1. Class 1 lever
   2. Class 2 lever
   3. Class 3 lever
   4. Class 4 lever
5. Calculate the effort required to lift a 10 Newton load with (L3.4)  
    a crowbar in the figure below.  
     
   1. 33 Newton’s
   2. 0.3 Newton’s
   3. 3.3 Newton’s
   4. 6 Newton’s
6. One set of gears are connected together. The smaller cog has 12 teeth (L3.4)   
   and the larger cog has 20 teeth. The smaller cog rotates 40 times  
   per second. How many times per second will the larger cog rotate?
   1. 24 times per second
   2. 67 times per second
   3. 58 times per second
   4. 87 times per second
7. Two pulleys are used to lift a load of 19000 Newton’s, 4 metres (L3.4)  
   above a surface. How much effort would be required to lift the load?



* 1. 4750 Newton’s
  2. 9500 Newton’s
  3. 76000 Newton’s
  4. 38000 Newton’s

1. An electric motor has an input of 4kW and an output of 3.3KW. (L3.4)   
   The efficiency of the motor is?
   1. 90%
   2. 100%
   3. 82.5%
   4. 121%
2. What is the correct formula for calculating work done? (L3.3)
   1. Work done = mass x acceleration x time taken
   2. Work done = force x distance
3. Which of the following statements is true? (L4.1)
   1. Electrons are positively charged and Protons are negatively charged.
   2. Electrons are negatively charged and Protons are positively charged.
   3. Neutrons are negatively charged and Protons are positively charged.
   4. Electrons are negatively charged and Neutrons are positively charged.
4. Identify the material which could act as an insulator. (L4.2)
   1. Gold
   2. Tungsten
   3. Glass
   4. Aluminium
5. A 6mm2 cooper conductor has a resistivity of 1.78x10-8 and is (L4.3)  
   87 meters long. What is the resistance of the conductor?
   1. 0.26 Ohms
   2. 2.6 Ohms
   3. 26µ Ohms
   4. 26m Ohms
6. Which of the following materials would have the lowest resistivity? (L4.3)
   1. Air
   2. Aluminium
   3. Iron
   4. Copper
7. Which of the following statements is correct? (L4.4)
   1. As the voltage and the current increases, the resistance will decrease.
   2. As voltage increases, the current will also increase if the resistance stays the same.
   3. Current will decrease if resistance decreases and voltage stays the same.
   4. Voltage will increase if resistance increases and the current increases.
8. Which formula predicts the effect of Voltage, Current and Resistance? (L4.4)
9. As current flows in a series circuit, the current will: (L4.4)
   1. increase as it returns to the supply.
   2. decrease as it flows through each resistor of the circuit.
   3. stay the same throughout the circuit.
   4. not flow as the circuit is not connected in parallel.
10. Three resistors of equal value are placed in series and are connected (L4.5)  
    to a 12 Volt supply, 1.3 Amps flows through the resistors. What are   
    the values of each of the resistors?
    1. 2.3 Ohms
    2. 3 Ohms
    3. 2 Ohms
    4. 3.2 Ohms
11. Four resistors with values of 12 Ohms, 7.5 Ohms, 9 Ohms and 4.8 Ohms (L4.5)  
    are wired in parallel and connected to a 110 Volt supply. How much   
    current will flow through the 7.5 Ohm resistor?
    1. 14.7 Amps
    2. 9.2 Amps
    3. 12.2 Amps
    4. 23 Amps
12. What is the total resistance of the following resistors when wired in parallel: (L4.5)  
    13 Ohms, 25 Ohms, 6 Ohms, 18 Ohms and 9 Ohms?

9Ω

18Ω

6Ω

25Ω

13 Ω

* 1. 71 Ohms
  2. 7.1 Ohms
  3. 2.2 Ohms
  4. 22 Ohms

1. A circuit has a total resistance of 12 Ohms and 6.44 Amps flows through it. How much power will the circuit dissipate?
   1. 77 Watts
   2. 1.86 Watts
   3. 927 Watts
   4. 498 Watts

152.An electric heater with a resistance of 16 Ohms is connected to a 220 Volt d.c. supply. What is the power dissipated by the heater?

* 1. 13.8 Watts
  2. 0.073 Watts
  3. 3 kilowatts
  4. 3520 Watts

153.Calculate the volt drop of a circuit with a resistance of 1.2 Ohms with a current flow of 15 Amps.

* 1. 18 Volts
  2. 12.5 Volt
  3. 0.08 Volts
  4. 6 Volts

154.Which of the following effect would happen to a circuit if the current flow in the circuit was to increase?

* 1. The voltage of the circuit would increase
  2. The resistance of the circuit would increase
  3. The magnetic field would decrease
  4. The power in the circuit would collapse

1. The effect that allows us to perform electroplating is: (L4.8)
   1. Magnetic
   2. Thermal
   3. Chemical
   4. Solar
2. The Tesla is the measurement for: (L5.2)
   1. Magnetic flux density
   2. Magnetic flux
   3. Induction
   4. Frequency

1. The correct formula to calculate Magnetic flux density is: (L5.2)
2. Two current carry conductors are placed side by side (see fig below). (L5.3)  
   What will happen to the conductors?  
     
     
     
     
   1. They will rotate clockwise around each other
   2. The magnetic field of each conductor will cancel each other out
   3. They will repulse away from each other
   4. They will attract towards each other
3. Identify where the South Pole would be on this solenoid (see fig below).

D

C

A

B

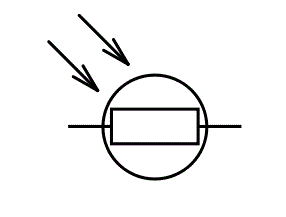
* 1. A
  2. B
  3. C
  4. D

1. A current carrying conductor is placed within a magnetic field. Which direction will the conductor (in the fig below) move?

N

S

* 1. Left
  2. Right
  3. Down
  4. Up

1. An alternator has a frequency of 60Hz. How long does it take to perform (L5.4)  
   two full revolutions?
   1. 330 milliseconds
   2. 17 milliseconds
   3. 60 milliseconds
   4. 33 milliseconds
2. What is the generated emf when a 5000mm long conductor cuts a magnetic field of 0.5 Teslas at a velocity of 0.42 m/s?
   1. 1 V
   2. 1050 V
   3. 105 V
   4. 15 V
3. Which electronic device is designed to store an electrical charge? (L6.2)
   1. Resistor
   2. Diode
   3. Capacitor
   4. Diac
4. Which electronic device has the symbol (in the fig below)? (L6.2)  
     
      
   1. A thermistor
   2. A Light admitting diode
   3. A Thyristor
   4. A light dependant resistor
5. What names are given to the two connections of a diode? (L6.2)
   1. Anode and electrode
   2. Cathode and electrode
   3. Triac and Diac
   4. Anode and Cathode
6. Which of the following electronic devices are suitable for detecting temperature change?
   1. Variable resistor
   2. Thermistors
   3. Zener Diode
   4. Triac
7. From a 50 metre cable drum, you have installed 13.6 metres of cable. (L 1.1)  
   What percentage of cable has been used?
   1. 3.8%
   2. 72.8%
   3. 27.2%
   4. 65%
8. An insulation resistance tester is used to record the following values: (L 1.1)  
   55MΩ, 72MΩ, 55MΩ, 18.5Ω, 10 MΩ and 89MΩ. What is the mean of   
   these values?
   1. 49.9MΩ
   2. 89MΩ
   3. 55MΩ
   4. 18.5MΩ
9. The SI unit for resistivity is? (L2.2)
   1. Ohm
   2. Ωm
   3. R
   4. Ω
10. Potential Difference is measured in? (L2.2)
    1. Amps
    2. Volts
    3. Newton’s
    4. Joule’s
11. In the SI system, time is measured in? (L2.1)
    1. Hours
    2. Minutes
    3. Seconds
    4. Kelvin’s
12. Which instrument would be used to measure the resistance of a circuit? (L2.3)
    1. Ohm meter
    2. Conductance meter
    3. Continuity meter
    4. Amp meter

1. The SI unit for Capacitance is the? (L2.2)
   1. Volt
   2. Henry
   3. Hertz
   4. Farad
2. A load generates a force of 300 Newton’s. Calculate the mass of the load. (L3.4)
   1. 3.6 kg
   2. 3060 kg
   3. 306 kg
   4. 30.6 kg
3. Lifting a load an electric motor uses 180,000 Joules of energy in 1 ½ minutes. (L3.4)  
   What is the power rating of the motor?
   1. 500 W
   2. 1 kW
   3. 1.5 kW
   4. 2 kW

1. Crowbars are an example of what type of lever? (L3.2)
   1. Class 1
   2. Class 2
   3. Class 3
   4. Class 4
2. Force on a load is considered to be a combination of: (L3.3)
   1. mass and gravity
   2. time and acceleration
   3. weight and energy
   4. energy and work done
3. An electric motor has a 1.8 kW input and an efficiency of 88%. (L3.4)  
   What is the motor’s output?
   1. 1.12 kW
   2. 160 W
   3. 1.6 kW
   4. 160 kW
4. A four pulley system is required to lift a load force of 20000 Newton’s. (L3.4)  
   What is the effort force required to lift this load?
   1. 5000 N
   2. 800000 N
   3. 5000 kg
   4. 10000 N
5. A set of gears has a ratio of 16:1. The smaller cogwheel has 9 teeth. How many teeth does the larger cogwheel have?
   1. 14
   2. 41
   3. 82
   4. 144
6. Current is described as:
   1. the pressure to move the charge within a circuit.
   2. the movement of electrons within a closed circuit.
   3. the movement of protons within a conductor.
   4. the standing force of the neutrons within an open circuit.
7. Porcelain is best described as?
   1. A good conductor of electricity
   2. A semi-conductor of electricity
   3. An unstable conductor of electricity
   4. A good insulator of electricity
8. A 2.5mm2 copper conductor has a resistance of 1.5 Ohms. If the conductor’s length is doubled what would the resulting resistance be?
   1. 6 Ohms
   2. 1.5 Ohms
   3. 3 Ohms
   4. 0.3 Ohms
9. A copper conductor has a resistance of 0.62 Ohms and is 36 meters long. What size is the conductor? Take the resistivity of copper to be 0.0172µΩm.
   1. 1mm2
   2. 1.5mm2
   3. 2.5mm2
   4. 4mm2
10. Two 4mm2 copper conductors are connected in parallel. Each conductor has a resistance of 0.5 Ohms. What is the combined resistance of the two conductors?
    1. 0.5 Ohms
    2. 0.25 Ohms
    3. 1 Ohm
    4. 0.75 Ohms
11. Four resistors each with an equal value of 6 Ohms are wired in parallel. (L4.5)  
    What is the combined total resistance of the resistors?
    1. 24 Ohms
    2. 3 Ohms
    3. 1.5 Ohms
    4. 0.75 Ohms
12. A 5 Ohm resistor and a 7 Ohm resistor are wired in series and connected to a 25 volt supply. What is the power dissipated in the 7 Ohm resistor?
    1. 52 Watts
    2. 57 Watts
    3. 89 Watts
    4. 30 Watts
13. A copper conductor is forty meters long and has a c.s.a of 6mm2.If the conductor material was changed to aluminium the resulting resistance would be:
    1. the same
    2. lower
    3. higher
    4. unstable

1. Which statement is correct with regards to what makes a good insulator? (L4.2)
   1. The electrons are tightly bound to the nucleus.
   2. The electrons are loosely bound to the nucleus.
   3. The protons are tightly bound to the nucleus.
   4. The protons are loosely bound to the nucleus.

1. Which of the following materials is a good conductor of electricity? (L4.2)
   1. Air
   2. Tungsten
   3. Glass
   4. Sand

1. Which effect would make a Fuse blow? (L4.8)
   1. Chemical
   2. Magnetic
   3. Thermal
   4. Solar
2. What is the total combined resistance of the resistors show in the figure below? (L4.5)

20Ω

10Ω

5 Ω

* 1. 35 Ohms
  2. 11.6 Ohms
  3. 2.9 Ohms
  4. 4.5 Ohms

1. What is the missing voltage value in the figure below? (L4.5)

17.3VV

1.92AA

?

7.7V

13 Ω

9 Ω

4 Ω

* 1. 25 Volts
  2. 12.5 Volt
  3. 50 Volts
  4. 27.5 Volts

1. A 16 Amp motor is connected to a cable with a very high resistance. (L4.7)  
   Which of the following issues would occur?
   1. The motor will pull more current than it is designed to pull and damage itself.
   2. Too much voltage will appear at the motor terminals damaging the motor.
   3. There will be not enough voltage to operate the motor.
   4. The motor would run in reverse.
2. An aluminium conductor has a resistance of 0.88 Ohm’s and a c.s.a of 1.5mm2. (L4.3)  
   How long is the conductor if it’s resistivity is 2.84x10-8 Ωm?
   1. 46.5 m
   2. 23 m
   3. 34.5 m
   4. 62 m
3. Magnetic Flux Density is defined by: (L5.2)
   1. the measurement of quantity of magnetic flux.
   2. the amount of flux in a given area.
   3. the strength of a magnetic.
   4. the magnets north and south poles.

1. A electric motor has a magnetic flux density of 30 Tesla’s which covers (L5.2)  
   an area of 250mm2. What is the motor’s magnetic flux value?
   1. 75 Wb
   2. 750 Wb
   3. 7.5mWb
   4. 7.5µWb

1. To induce an EMF into a conductor, what must you do? (L5.3)
   1. Wrap the conductor around a magnet
   2. Place and hold still a closed conductor within a magnetic field
   3. Attach a magnet onto a conductor
   4. Pass a closed conductor through a magnetic field
2.  (L5.4)
3. Identify the figure below the Period? (L5.5)

D

C

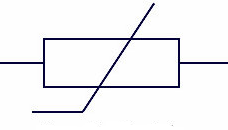
B

A

* 1. A
  2. B
  3. C
  4. D

1. The formula to calculate the induced EMF within a conductor is: (L5.4)
   1. E=VIL
   2. E=BIL
   3. E=vBl
   4. E=WbIL
2. How long would a conductor need to be to produce 12 Volts (L5.4)  
   when passed through a 0.9 Tesla magnet at 4m/s?
   1. 33 m
   2. 3.3 m
   3. 33 cm
   4. 33 mm
3. Identify the device in the figure below? (L6.2)  
     
     
   1. Triac
   2. Diac
   3. Resistor
   4. Diode

1. In which of the following equipment would you expect to find a (L6.2)  
   light dependant resistor?
   1. Smoke Detector
   2. Rectifier
   3. Solar sensor
   4. Dimmer switch
2. Identify the device in the figure below? (L6.2)



* 1. Triac
  2. Thermistor
  3. Resistor
  4. Inverter

1. Which device is used to change alternating current into direct current? (L6.2)
   1. Inverter
   2. Pacifier
   3. Converter
   4. Rectifier