WelTec
Te Whare Wānanga o te Awakairangi

DC fundamentals EE3103

Student workbook 2019

Power and energy theory and calculation exercises

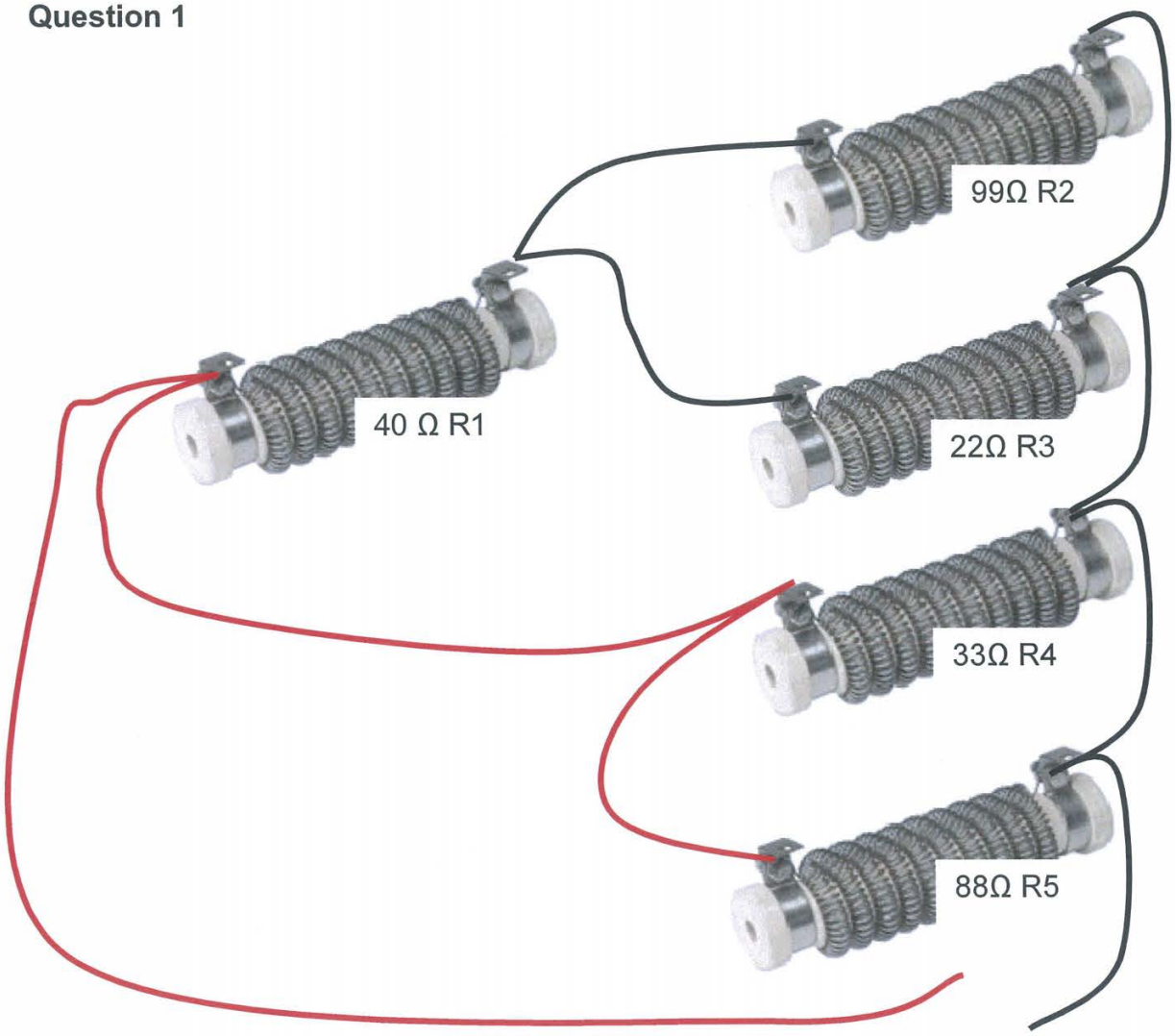
Student name

25070 Power and energy and the cost to run worksheet 5

Write the three power formula below

P = Power **P=** **P =** **P =**

Question 1



200 volts supply

a) Calculate from the circuit drawn above what the power dissipation is for the total circuit

b) Calculate the power dissipated in each individual resistor

c) Calculate the cost to run the whole circuit for 10 hours with a tariff of 27 cents per unit

1) a) 2356W b) R1 469W R2 39W R3 175W R4 1212W R5 454W c) $6.34
2) a) 203.94V b) 366W c) $27.38

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2) a) 203.94V b) 366W c) $27.38

Question 2

A 230 volt TPS cable supplies a heater that has a 15 ohm element.

The TPS cable has 0.5 ohms resistance in the phase conductor and has 0.5 ohms resistance in the neutral conductor.

The cable was damaged during installation and was joined in a connection box in the neutral wire. The terminal wasn't tightened sufficiently at this join and resulted in an extra cable resistance of 1 ohm.

Draw a circuit diagram of the above information and use that to calculate the following

a) The voltage across the heater element

b) The power dissipated in the cable (including the repair joint)

c) The cost to run the heater for 40 hours (including the power dissipated in the cables) at a tariff of 22 cents kWh

1) a) 2356W b) R1 469W R2 39W R3 175W R4 1212W R5 454W c) $6.34
2) a) 203.94V b) 366W c) $27.38