CRITERIA FOR SBAS

PLANNING AND DESIGNING (P/D)

		MARK(S)
a)	Development of hypothesis (if appropriate)	1
b)	Workable method outlined	1
c)	It should be clear	
	i) which variable(s) is/are to be kept constant	1 or more
	ii) how the dependent variable is measured	1
	iii) how the independent variable is measured	1
	iv) which other variable may affect measurements taken (see d (ii))	1

If the **students perform** the experiment, the points can be found in the results; if not the **points should be** found in the description of the method.

d)	**One or more** points from the following:	1 each
	i) non-standard precautions used to improve accuracy	
	ii) identification of sources of error which may affect the accuracy of the answer and could not be prevented	
	iii) repetition and averaging of readings	

A set of general criteria for assessing the Planning and Designing of electrical practicals is given below.

		MARK(S)
a)	Draws appropriate circuit diagram (symbols, arrangement)	2
b)	Shows how to take appropriate readings, i.e., how the variables are measured	2
c)	Shows how to change the variables, e.g., reversing diode, adjusting rheostat, varying length of wire	1
d)	Shows how results either support or refute the hypothesis OR shows how the values can be substituted into the appropriate formula	1

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OBERVATION / RECORDING / REPORTING (O/R/R)

			MARK(S)

1. Overall organisation of work

   a) Appropriate sub-headings   1

   b) Sub-headings in logical order   1

   c) Subject matter under appropriate sub-headings   1

2. Diagram(s) (if needed)

Adequate size (1) and fully labelled (3 marks maximum and one mark deducted for each significant label omitted or incorrect)

3. Report of method adopted

   a) Logical sequence in steps   1

   b) Concise account (no irrelevant material)   1

   c) Grammar and spelling: correct   2

                                   only one or two errors   1

                                   many errors   0

4. Recording of readings (when tabulation not suitable)

   a) Appropriate readings (where necessary)   1

   b) Readings in line with expected results (**accurate readings**)   1

   c) Units on readings   1

   d) Appropriate significant figures (**Consistent with instrument(s) used**)   1

   e) Repetition and averaging of readings   1 or 2

5. Tabulation of sets of readings

   a) **Neat table**   1

   b) Headings for tables labelled with quantity/symbol/unit   1

   c) Appropriate significant figures in each column

       (consistent with instrument(s) used)   1 or 2

   d) Good range of readings   1

   e) Adequate number of readings

       (usually six, and more when graph is curved)   1

6. Graph construction

    a)   Correct quantities plotted on axes   1

    b)   Title of graph with axes labelled with quantity or symbol and unit

            (one mark deducted for each omission)   2

    c)   Suitable scale for each axis, 1 each (linear, adequate size, convenient)   2

    d)   Fine circled points or sharp crosses, thin line   1

    e)   Accurate plotting of all readings

            (all points correct 3, one incorrect 2, two incorrect 1,

            three or more incorrect 0)   up to 3

    f)   Line of best fit (curved or straight)   1

MANIPULATION AND MEASUREMENT (M&M)

1. <u>Use of a thermometer in a liquid</u>

Criteria for assessment:

    i)   Liquid is stirred to ensure even temperature

    ii)   Thermometer bulb completely immersed

    iii)   Bulb not in contact with container

    iv)   Immersion time is sufficient for thermal equilibrium

2. <u>Use of measuring cylinder</u>

Criteria for assessment:

    i)   Appropriate size chosen (if relevant)

    ii)   Cylinder placed on horizontal surface

    iii)   Meniscus read to avoid parallax

    iv)   Bottom part of meniscus read

3. **Use of ammeter/voltmeter**

   Criteria for assessment:

   i) Ammeter/voltmeter of suitable range chosen (if appropriate)

   OR

   Appropriate scale on meter connected and read (if relevant)

   ii) Ammeter/voltmeter placed in correct position, from circuit diagram

   iii) Ammeter/voltmeter connected with correct polarity

   iv) Zero error checked

   v) Scale read to avoid parallax

   vi) Connections tightened

4. **Use of stop watch/stop clock**

   Criteria for assessment:

   i) Zero error checked

   ii) Stop watch/stop clock correctly operated

   iii) Count-down method used (if appropriate)

   iv) Scale read to avoid parallax (if appropriate)

5. **Use of a balance for mass determination**

   Criteria for assessment:

   i) Balance placed level

   ii) Zero error checked

   iii) Balance used with care

   iv) Scale read to avoid parallax (where appropriate)

6. **Use of Bunsen burner**

Criteria for assessment:

i) Bunsen burner attached properly to gas supply

ii) Air hole closed

iii) Match lit before gas turned on

iv) Air hole adjusted

v) Gas supply adjusted

7. **Use of a micrometer**

Criteria for assessment:

i) Zero error checked

ii) Micrometer closed gently (ratchet)

iii) Scale read to avoid parallax

8. **Use of a vernier caliper**

Criteria for assessment:

i) Zero error checked

ii) Caliper closed gently

iii) Scale read to avoid parallax

9. **Ray plotting**

Criteria for assessment:

i) Pins placed far apart

ii) Pins placed vertically

iii) Positions of pins labelled/lines drawn appropriately

iv) Base line of protractor placed on line

v) Centre of protractor correctly positioned

10. **Setting up of electrical circuit**

   Criteria for assessment:

   i) Correct circuit diagram drawn (if necessary)

   ii) Components correctly positioned, from circuit diagram

   iii) Components connected with correct polarity

   iv) Circuit wired with switch off

   v) Rheostat (or other component to limit current) set at maximum

   vi) Circuit switched off between readings

   vii) Connections tightened

11. **Use of a burette**

   Criteria for assessment:

   i) Burette rinsed with liquid to be used

   ii) Burette aligned vertically

   iii) Funnel used correctly

   iv) Tip filled with liquid

   v) Air bubbles removed

   vi) Hanging drops removed

   vii) Meniscus read to avoid parallax

   viii) Bottom of meniscus read

ANALYSIS AND INTERPRETATION (A&I)

			MARK(S)
1.	**Intercept**		
	a)	Accurate read-off to appropriate number of	1
		significant figures (based on number of	1
		significant figures used in plotting graph)	
	b)	Correct unit for intercept	1
	c)	Deduction of a quantity from intercept -	
		accurate answer, to correct number of	1
		significant figures, with unit	2
2.	**Slope or gradient**		
	a)	Large triangle	1
	b)	Formula for gradient correct	1
	c)	Accurate read-off (to appropriate number of	1
		significant figures, same as in the readings)	(1)
	d)	Calculation of gradient accurate	1
	e)	Appropriate significant figures, **and unit, for gradient**	2
	f)	Deduction of a quantity using **gradient** -	
		answer correct, appropriate number of significant figures, with unit	2
3.	**Calculations**		
	a)	Formula correct	1
	b)	Substitution correct	1
	c)	Answer with unit	1
	d)	Answer to appropriate number of significant figures	1
4.	**Conclusions**		
	a)	Conclusion follows from data or graph	1
	b)	Conclusion justified using data or graph	1
	c)	Unavoidable source(s) of error/	
		uncertainty in chosen method identified	1 or more