MARK SCHEME for the October/November 2006 question paper

9702 PHYSICS

9702/05

5 Paper 5 (Practical), maximum raw mark 30

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

• CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2006 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



Page 2	Mark Scheme	Syllabus	Paper
	GCE A/AS LEVEL - OCT/NOV 2006	9702	5

Question 1

(b)	(iii)	Resistance of LDR calculated correctly and greater than 1 k Ω and less than 100 k Ω .	1
(b)	(iv)	Justification of sf in <i>R</i> (in text or value in (iii)). Relate to V <u>and</u> I. Do not allow just one unless valid reason given. Do not allow 'raw' data. Ignore dp if SF correct.	1
(c)		Readings. Wrong trend in I (or R) –1. 6 sets scores two marks. 5 sets one mark. Allow more than 6 sets without penalty. Minor help from the Supervisor, –1. Major help, then –2. If help has been given then write SR at the top of the front page of the script, and give a brief explanation of the type of help that has been given by the table of results.	2
(c)		Ig R and Ig N correct; one mark each. Values must be checked.	2
(c)		Column headings consistent. Ignore POT. V, I, R and IgR column heading must contain a quantity and any valid unit. e.g. $Ig(R/\Omega)$.	1
(c)		Consistency of raw readings. I and V only.	1
(d)	(i)	Axes inverted or wrong graph loses this mark. The axes must be labelled with the quantities plotted. (ignore units) The plotted points must occupy at least half the graph grid in both the <i>x</i> and <i>y</i> directions (i.e. 4 large squares in the x-direction and 6 large squares in the <i>y</i> -direction). Do not allow more than 3 large squares between the labels on an axis. Do not allow awkward scales (e.g. 3:10, 6:10 etc.).	1
(d)	(i)	Plotting of points All the observations must be plotted. Count the number of plots and ring this total on the grid. Do not allow plots in the margin area. Check one suspect plot. Circle this plot. Tick if correct. If incorrect, mark the correct position with a small cross and use an arrow to indicate where the plot should have been, and -1. Allow errors up to and including half a small square.	1
(d)	(ii)	Line of best fit. Too much scatter loses this mark. A linear trend is expected for this mark. At least 5 or more trend plots on the grid. There must be a reasonable balance of points about the drawn line.	1
(d)	(iii)	Gradient. Expect negative gradient. Allow ecf. Ignore any units given with the value. Hypotenuse of Δ must be \geq half the length of line drawn. Check the read-offs. Work to half a small square. $\Delta x / \Delta y$ gets zero. Values taken from the table that lie on the line to within half a small square are acceptable.	1
(d)	(iii)	<i>y</i> -intercept Accept substitution into $y = mx + c$ using a point on the line.	1
(e)		a = 10 ^{y-intercept} Check value from candidate's y-intercept. Allow ecf. from graph	1
(e)		<i>b</i> = gradient. Allow ecf from graph.	1

	Page	3	Mark Scheme	Syllabus	Paper
			GCE A/AS LEVEL - OCT/NOV 2006	9702	5
(f)	(i)	Value (If out	of diameter of pin. Check value between 0.60 – 0.70 mm. of range check Supervisor's value \pm 0.05 mm)	Must have 2dp.	. 1
(f)	(ii)	Checł Expec	substitution for area of check value if no substitution. Ignet $A = 0.33 \text{ mm}^2$. allow ecf from (f) (i).	ore POT.	1
(f)	(iii)	Repea	at readings of diameter (and check area).		1
(g)		Value	of R in range 200 – 2000 Ω .		1
(g)		2/3 S.	F. only.		1

20 marks in total.

	Page 4	Mark Scheme	Syllabus	Paper	
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Question 2					
A1	(Measure) j i.e. correct This mark c	<u>o.d.</u> and find a <u>force</u> (could be in a table or graph). Change procedure. Do not give for only identifying the variables. can be scored if the method is unworkable.	p.d. and repeat	. 1	
A2	Measureme diagram or	ent of p.d. – voltmeter connected in parallel with capacitor o voltage read from power supply in text. Wrong diag loses t	r power supply o his mark.	on 1	
A3	Workable e Ignore Volt Do not allov If diagram v	lectrical arrangement: <u>d.c.</u> power supply on diag or in text. meter in series. Ammeter in parallel loses this mark. <i>w</i> discharge of circuit while measuring force. wrong this loses this mark.		1	
A4	Method of o Variable po Do not allow	changing the p.d. (diag or text). wer supply or potential divider circuit. Do no allow variable w changing distance.	resistor in serie	1 s.	
B1	Measure th Or measure	e force/(mass) with <u>tpb</u> or force with <u>newtonmeter</u> . e force from a mass/lever/pulley system.		1	
B2	Workable n Allow worka	nechanical arrangement to measure force on diag. able loading/lever/pulley system.		1	
B3	Plates clos make force	e together/large surface area or HT/EHT/hight voltage to large/measurable.		1	
С	Any one sa e.g. wear ir discharge b Do not allow	fety precaution <u>with reason</u> . Isulating/rubber gloves: earth/insulate one plate wrt top par before touching plates <u>to avoid/prevent shock/short circuit</u> . w not touching plates (precaution needed).	n balance or nev	1 vtonmeter;	
D1/2	Any further Some of the Two fixed p Distance be Method of a dielectrics)/ Force = mg Force is the Calibrate sp Approx. p.d	good design features. ese might be: points shown on the diagram (appropriate clamps or suppor etween the plates should be kept constant. achieving constant separation of plates (spacers or measur adjust newtonmeter position to give same separation. e change in readings. orings to give force reading. I (greater than 100 V)/distance (less than 1 cm)/Area (great	ts). ement; no insula er than 400 cm2	2 Itors or	

10 marks in total.