

JUNE 2002

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK : 80

SYLLABUS/COMPONENT : 0625/3

**PHYSICS
(EXTENDED)**



Page 1	Mark Scheme	Syllabus	Paper
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- 1 a height of stairs/number and height of each stair B1
time B1
weight/mass (x g) B1
any attempt at repeat and average for time only B1 4
- b work = force or weight x distance B1
power = work/time B1 2
- c(i) potential B1
(ii) any 2: kinetic energy (to move)/heat(and sound)/energy to move arms etc B2 3
QT 9
- 2 a(i) acceleration/increasing speed B1
a(ii) deceleration/decreasing speed B1
acceleration in (i) and deceleration in (ii) both stated as constant/uniform B1 3
- b overall fall in speed/bouncing/change in direction/ball squashed/
time very small/sudden/instantaneous at bounce any 2 B2 2
- c(i) 1.5 (m/s) A1
(ii) 17.5 (m/s) A1 2
- d speed scalar and velocity vector/ velocity has direction B1
direction does not affect speed change B1
direction affects velocity change/ has + and - effect etc B1 M2
- e any use of area of triangle/use of average speed x time C1
3.0 m / 3.4 m range A1 2
- f use of change in speed/time or 8/.8 M1
10 m/s/s A1 2
QT 13
- 3 a vapour mols higher (total) energies than liquid mols/ correct ref. to k.e./p.e. B1
only most energetic molecules can leave liquid B1 2
- b increased temp(of liquid)/increase surface area/blow air over surface,any 2 B2 2
- c overcome attractive forces in liquid B1
separate molecules to (much) greater distances apart B1 2
QT 6

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- 4 a p.v. is a constant, (so p.l. is a constant), however expressed C1
 $80 \times 1 = l \times 3.8$, however expressed C1
 $l = 21 \text{ mm}$ A1 3
- b(i) put in (melting) ice and put in steam (over boiling water) M1
mark piston position for one or both fixed points A1
Any reference to wait for equilibrium, however expressed A1
Divide length between fixed points into 100 or other suitable calibration A1 M3
- (ii) immerse cylinder in water (so that water covers at least the air column) M1
leave for long time however expressed A1
read length, use scale to give temp. A1 M2
QT 8
- 5 a angle $i = \text{angle } r$ B1
ray to right-hand end of mirror from P, correctly reflected (judged by eye) M1
part shaded, beyond candidates reflected ray from end of mirror only A1 3
- b any construction which attempts to use angle $i = \text{angle } r$ C1
 $1.6 \text{ m} = \pm 0.2 \text{ m}$ A1 2
- c virtual/upright/ same size or distance as object/laterally inverted, any 2 B2 2
(real/ inverted/ magnified/ diminished each disqualifies one correct answer) QT 7
- 6 a use of frequency = velocity/wavelength C1
 $= 6 \times 10^{14} \text{ Hz}$ A1 2
- b(i) 340×3.6 C1
 $= 1224 \text{ m}$ A1
- (ii) value so big time is negligible however expressed B1 3
- c refraction and dispersion at first face B1
refraction and dispersion at second face B1
colours correct B1 M2
QT 7
- 7 a electrons rubbed off one sphere, becomes positive B1
electrons deposited on other sphere, becomes negative B1 2
- b any reasonable attempt showing lines from one sphere to the other B1
field correct with arrows from + to -, at least 2, none wrong B1 2
- c(i) $(2 \times 10^{10} \times 1.6 \times 10^{-19})$
 $= 3.2 \times 10^{-9} \text{ (C)}$ A1
- (ii) 3.2×10^{-9} or answer to (i) / 1.0×10^{-3} C1
 $= 3.2 \times 10^{-6} \text{ A}$ A1 3
QT 7

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8 a	240/15 or 15/240 or primary volts/sec volts or sec volts/primary volts = 16 or 0.0625	C1 A1	2
b	any d.c. shown regardless of shape or position half wave rectified shown	C1 A1	2
c	diode only conducts in one direction conducts on one half cycle of a.c. but not on opposite half cycle	B1 B1	2
d	battery in correct place, correct polarity	B1	1
e(i)	power = VI or power = 12×2 = 24 W	C1 A1	
(ii)	energy = VIt where t is in secs or energy = $12 \times 2 \times 1.08 \times 10^5 / 0.024 \times 30$ = 2.6×10^6 J / 0.72 kWh (allow e.c.f. from (i))	C1 A1 QT	4 11
9 a	connect terminals of 1V supply to Y's, note scale reading (up/down as 1V) measure equal intervals up(and down) scale to give voltage scale	B1 B1	2
b	C connected to one Y terminal D connected to other Y terminal	B1 B1	2
c	p.d. A to F = p.d. (B to C + C to D + D to E)	B2 QT	2 6
1 a	source and detector above liquid surface set-up correct for detecting alpha radiation with suitably placed absorber	C1 A1	2
b	take reading with no absorber and through cardboard/paper subtract readings to give alpha estimate	B1 B1	2
c	any "distance" precaution any shielding precaution any other, but must be related to this situation	B1 B1 B1 QT	M2 6
PAPER TOTAL			80