

IGCSE PHYSICS 4420, NOVEMBER 2005 MARK SCHEME

Paper 1F

Question 1

Answer(s)	Extra information	
(a) pull	do not credit if any ambiguity	1
(b) friction (1) gravity (1) electrostatic (1)	allow 'weight' allow 'electrical' or 'electricity'	3
(c) small mass of lorry slow speed of lorry short reaction time of driver	all three correct (2) any two correct (1) otherwise (0)	2
(d) stationary/ stopped/not moving (i)		1
(d) A and C (ii)	or C and A	1
gradient/slope		1

Total 9 marks

Question 2

(a) orange (1) green (1)	both correct but order reversed (1)	2
(b) (visible) light (i)	or visible spectrum	1
(b) frequency (ii)	do not credit if any ambiguity	1
(c) cooking/heating food/drink (1) communications/communicating (1)	allow 'for ovens' and 'in kitchens' do not credit just 'for heating' or satellite transmissions	2
(d) sterilise	or 'kill germs on'	1
(e) burn it	assume 'it' refers to skin do not credit 'sunburn'/'cancer' do not credit just 'redden it' do not credit just 'damage/destroy it'	1

Total 8 marks

Question 3

- | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| (a) (13 A) fuse
(i) | allow any rating below 13 A but do not credit any rating above 13 A | 1 |
| (a) any two (1) each of
(ii) <ul style="list-style-type: none">• (electric) shock• water conducts electricity | or your (wet) skin would conduct
do not credit 'water and electricity don't mix'
do not credit 'explode' 'blow up' 'fire'
allow 'electrocution' | 2 |
| (b) current (1)

melt/ fuse/ burn (1) | or 'load'
do not credit 'voltage' 'power' 'juice' | 2 |
| (c) C and D
(i) | allow any method which unambiguously shows this e.g. both ringed | 1 |
| (c) no conducting path from inside to
(ii) outside/ from outside to inside (2) | allow 'metal conducts electricity but plastic/non-metal does not' for (1) | 2 |

Total 8 marks

Question 4

- | | | |
|---------------------|-------------------------------------------------------------------|---|
| (a) elastic/ strain | | 1 |
| (b) kinetic | allow gravitational (potential)
do not credit just 'potential' | 1 |
| (c) friction | or air resistance
or (force of) gravity
or weight | 1 |
| (d) gravitational | | 1 |

Total 4 marks

Question 5

- (a) convection (current(s)) 1
(i) gets less 1
(ii) any three (1) each of
- (it is) an insulator
 - made of wool/material which is an insulator
 - trap/holds air
 - (still air) is an especially/very good insulator
- assume 'it' refers to the blanket
take poor conductor to be equivalent to insulator throughout
not just 'made of wool' for this point
- unless this is the only mark for 'insulation' must have appropriate qualification to gain credit 3

Total 5 marks

Question 6

- (a) solid (1)
(i) melting (1)
boiling/evaporation (1)
- (b) ... are about as far apart ... (1)
... move randomly (1)
- (c) any two (1) each
- hit it/collide with it
exert a force on it
(hence) exert (a) pressure (on the surface)
- do not credit 'ice'
accept 'melts'
accept 'boils'/'evaporates' 3
- accept any unambiguous method of indicating the answer
if more than two indicated mark only the first two going down the list 2
- assume 'it' refers to the inside of the cylinder
ignore any reference to corrosion or similar 2

Total 7 marks

Question 7

- (a) iron (1)
steel (1)
- (b) iron (1)
steel (1)
- accept any unambiguous indication of the correct answers
deduct (1) each (minimum total = 0) for more than two responses 2
- accept any unambiguous indication of the correct answers
deduct (1) each (minimum total = 0) for more than two responses 2

- (c) bring (ends of) bars close (to each other in turn) (1)

the pair (of bars) which repel are the (bar) magnets

or the one/(bar) magnet which only attracts/ is attracted/ never repels/ is never repelled is the one which is not a (bar) magnet

2

Total 6 marks

Question 8

- (a) Geiger-Muller tube (1)
photographic film (1)

accept any unambiguous indication of the correct answers
deduct (1) each (minimum total = 0) for more than two responses

2

- (b) Nucleus (1)
gamma/ γ (1)
rocks (1)
electrons (1)
unstable (1)
isotopes (1)

'No good researcher ever used isotopes'

or isotopes

6

Total 8 marks

Common questions

Question 9

- (a) longitudinal 1
- (b) use and recall $v = f \times \lambda$ 1
 $384 \times 0.86 = 330$ (m/s) 1
- (c) no 1
(i)
- (c) not within (audible) range of 20 - 20 000 Hz 1
(ii) frequency too high

Total 5 marks

Question 10

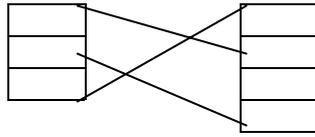
(a)	insulator	zero if both boxes ticked for one row	1
	insulator		1
(b)	1 mark each for any two		
	<ul style="list-style-type: none"> • (electrons) move from the cloth • to the rod • electrons are negative(ly charged) 		
		Maximum	2
(c)	to the rod / right		1
(i)			
(c)	positive /similar charges repel		
(ii)	or		
	opposite / unlike charges attract		1
Total 6 marks			

Question 11

(a)	five correctly plotted points	\pm half a small square	
		-1 for each misplot or missing plot to a maximum of 2	2
	best straight line	through 0,0 and at least one point on either side of the line	1
(b)	2.9 (cm)	2.8 - 3.0 cm read from graph \pm half small square	1
(c)	not linear relationship for large loads OWTTE	beyond elastic limit	1
(d)	(helical)spring	allow (metal) wire	1
(i)			
(d)	straight region indicates wire or spring (1)	any other reason why it might be spring/wire	
(ii)			
	curved line would be seen for rubber band (1)	any reason why it isn't rubber band	
	extension too great for wire (1)	reason why it isn't wire	
	<i>not allowed if answered wire in (i)</i>		
		Maximum	2
Total 8 marks			

Question 12

(a)



3

(b) none/zero

1

(i)

(b) particle moving parallel to the

(ii) field(lines)

1

Total 5 marks

Question 13

(a) light to

1

electrical

1

(b) 6000 / 120

$6000 / 2 = 3000$

1

(i)

scores 1

= 50(W)

1

(b) 1 mark each for **any two**

(ii)

rays change angle of incidence at roof (1)

clouds/weather conditions (1)

no sun at night (1)

Maximum 2

Total 6 marks

Question 14

(a) reflection

1

(b) draw reflected ray

angles of incidence and reflection equal by eye

1

draw second ray from cat tail reflected in mirror

ditto

1

drawn reflected rays converge at C

1

Total 4 marks

Question 15

- (a) a.c. not 'cell is d.c.' 1
1
(a) larger voltage 1
2
(b) lamps in parallel with cell 1

each lamp can be switched off/on independently 1

Total 4 marks

Question 16

- (a) correct substitution once into
(i)
 $density = \frac{mass}{volume}$ 1

copper 9 000 iron 8 000 1

(a) iron 1
(ii)
(a) copper 1
(iii)
(b) measure length, (breadth, width) OWTTE 1

with a rule 1

multiply together or cube it 1

Total 7 marks

Total for Paper: 100 Marks