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**PHYSICS**

**0625/32**

Paper 3 Core Theory

**October/November 2017**

MARK SCHEME

Maximum Mark: 80

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**Published**

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This document consists of **7** printed pages.

Question	Answer	Marks
1(a)	2nd line – advantage	<b>B1</b>
	3rd line – advantage	<b>B1</b>
	4th line – disadvantage	<b>B1</b>
1(b)	any three from: (cold) water is pumped into the ground warm rocks heat water / hot water turns to steam / water boils (steam) drives or turns or moves turbine (turbine) drives or turns or moves generator	<b>B3</b>

Question	Answer	Marks
2(a)	A – accelerates (from rest)	<b>B1</b>
	B – constant speed (of 2 m / s)	<b>B1</b>
	C – accelerates at faster rate / higher acceleration than previously	<b>B1</b>
	D – faster constant speed (of 10 m / s)	<b>B1</b>
2(b)	2 minutes = 120 s	<b>C1</b>
	area under the graph OR $d = s \times t$ OR $2 \times 120$	<b>C1</b>
	240 (m)	<b>A1</b>

Question	Answer	Marks
3(a)(i)	$D = M/V$	C1
	450 / 145	C1
	3.1 (g / cm <sup>3</sup> )	A1
3(a)(ii)	$W = m \times g$ in any form	C1
	$0.45 \times 10$	C1
	4.5 (N)	A1
3(b)	$P = F/A$ in any form	C1
	30 / 80	C1
	0.375 (N / cm <sup>2</sup> ) OR 0.38 (N / cm <sup>2</sup> )	A1

Question	Answer	Marks
4(a)	(gravitational) <u>potential</u> (energy)	B1
4(b)	arrow at the lowest point of swing	B1
4(c)	friction / air resistance / drag	B1
4(d)	any three from: cabin has kinetic energy two surfaces rub together / friction thermal energy generated / KE transferred to thermal dissipated to surroundings / air	B3

Question	Answer	Marks
5(a)	<u>insulator</u>	<b>B1</b>
5(b)	Any five from: conduction / slow or limited transfer of thermal energy molecules move slower / lose kinetic energy convection stated as (drink cools) volume decreases density (of cooler drink) increases cooler water falls evaporation (of hot water) more energetic molecules escape / less energetic molecules remain	<b>B5</b>

Question	Answer	Marks
6(a)	normal correctly positioned	<b>B1</b>
6(a)(ii)	correct reflected ray at 45° to normal	<b>B1</b>
6(a)(iii)	<i>r</i> correctly indicated	<b>B1</b>
6(a)(iv)	angle <i>i</i> = angle <i>r</i>	<b>B1</b>
6(b)	parallel to the incident ray at P	<b>B1</b>
6(c)	F correctly labelled / 10 cm from lens	<b>B1</b>
	<u>10 (cm)</u>	<b>B1</b>

Question	Answer	Marks
7(a)	<u>green</u> and <u>indigo</u>	<b>B1</b>
7(b)	<u>radio</u> and <u>microwaves</u>	<b>B1</b>
	<u>infra-red</u>	<b>B1</b>
7(c)	damages cells / heats cells	<b>B1</b>
7(d)	reduced exposure / leave room / move far away	<b>B1</b>
	metal apron / exposure badge / metal shielding	<b>B1</b>

Question	Answer	Marks
8(a)	1st row tick under orbiting the nucleus	<b>B1</b>
	2nd row tick under in the nucleus	<b>B1</b>
	3rd row tick under in the nucleus	<b>B1</b>
8(b)(i)	<u>6</u>	<b>B1</b>
8(b)(ii)	<u>13</u>	<b>B1</b>
8(c)(i)	same proton / atomic number	<b>B1</b>
	different nucleon number / number of neutrons / mass number	<b>B1</b>
8(c)(ii)	any acceptable isotope with proton number of 6	<b>B1</b>

Question	Answer	Marks
9(a)(i)	steel	<b>B1</b>
9(b)(i)	variable resistor indicated	<b>B1</b>
9(b)(ii)	(steel) bar inside coil	<b>B1</b>
	switch closed OR current increased through coil	<b>B1</b>
	bar moved through coil (in same direction) OR current decreased and switch opened	<b>B1</b>
9(c)	at least one complete correct field line through and above coil	<b>B1</b>
	at least one complete correct field line through and below coil	<b>B1</b>

Question	Answer	Marks
10(a)(i)	<u>25.6</u> ( $\Omega$ )	<b>B1</b>
10(a)(ii)	$V = IR$ in any form	<b>C1</b>
	$0.23 \times 5.6$	<b>C1</b>
	1.29 OR 1.3	<b>A1</b>
10(b)	resistance decreases	<b>B1</b>
	current increases	<b>B1</b>

Question	Answer	Marks
11(a)	$N_1/N_2 = V_1/V_2$	<b>C1</b>
	$(49 / 900) \times 220$ OR use of ratios seen	<b>C1</b>
	11.98 OR 12 (V)	<b>A1</b>
11(b)	copper	<b>B1</b>
11(c)	d.c. is in one direction only / a.c. changes direction	<b>B1</b>

Question	Answer	Marks
12(a)(i)	electric bell working owtte	<b>B1</b>
	no sound from bell / bell is quieter	<b>B1</b>
12(a)(ii)	any two from: sound will travel through air / glass sound will not cross a vacuum sound needs a medium to travel through	<b>B2</b>
12(a)(iii)	<u>vibrations</u>	<b>B1</b>
12(b)	20 Hz from first column	<b>B1</b>
	20 kHz from second column	<b>B1</b>