



金匯教育(上市編號:8160)成員

屯門 天水圍 元朗 大埔 九龍城 觀塘 沙田 慈雲山 將軍澳 深水埗 粉嶺 石蔭 港、九、新界 分校陸續開幕



HKDSE MOCK EXAMINATION 2023

Physics

Marking Scheme

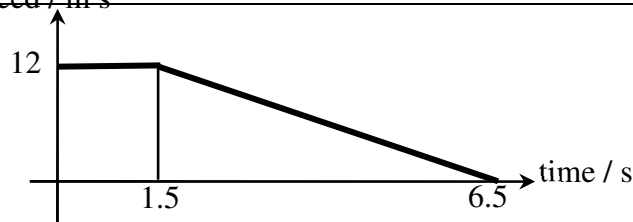
Marking Scheme

Paper I Section A

Question No.	Key		Question No.	Key
1.	B		26.	C
2.	B		27.	C
3.	A		28.	C
4.	D		29.	B
5.	B		30.	C
6.	D		31.	C
7.	C		32.	A
8.	D		33.	D
9.	A			
10.	D			
11.	B			
12.	B			
13.	A			
14.	A			
15.	B			
16.	C			
17.	C			
18.	B			
19.	B			
20.	D			
21.	D			
22.	A			
23.	C			
24.	A			
25.	C			

Paper I Section B

				Marks
1.	(a)		Hard snow blocks are <u>good insulators</u> since there is <u>trapped air</u> inside them.	1 M + 1 M
	(b)	(i)	Hot air is <u>less dense</u> therefore it <u>floats up</u> to the top of the igloo.	1 A + 1 A
		(ii)	Cold air is <u>denser</u> therefore it <u>sinks down</u> the bottom of the igloo.	1 M + 1 M
	(c)		The air hole on the top <u>lets air to enter</u> which <u>avoids suffocation</u> .	1 M + 1 M
2.	(a)	(i)	16.0 mol	1 M + 1 A
		(ii)	$n_x = 6.47$ mol (6.35 ~ 6.45 accepted) $n_y = 9.63$ mol (9.53 ~ 9.65 accepted)	1 M + 1 A
		(iii)	$\Delta n = 2.40$ mol (2.35 ~ 2.45 accepted)	1 M + 1 A
		(iv)	The volume of capillary tube is negligible	1 M
			Nitrogen is an ideal gas.	1 M
	(b)	(i)	$M_x : M_y = 31 : 90$	1 M + 1 A
		(ii)	The thread moves from X to Y.	2 M + 1 M
3.	(a)	(i)	58.86 J	1 M + 1 A
		(ii)	19.62 J	
	(b)		Part of the loss of potential energy of P converts to the kinetic energy of P and Q.	1 M
			4.43 m s ⁻¹	1 A
4.	(a)		1.5 s	1 M + 1 A
	(b)		-2.4 m s ⁻²	1 M + 1 A
	(c)		6.5 s	1 M + 1 A
			speed / m s ⁻¹	4 M



			Marks
5.	(a)	Put some sponge at the edge of the ripple tank.	1 M
	(b)	The wave produced by the dot vibrator <u>transfers to all direction</u> and the wavefront is always <u>perpendicular to the propagation direction</u> .	1 M + 1 M
	(c)	(i) 4 cm	1 A
		(ii) 2 m s^{-1}	1 A
		(iii) $\Delta x^p = 0 \text{ cm}$	1 A
		$\Delta x^v = 3 \text{ cm}$	1 A
		Constructive interference occurs at <i>P</i> .	1 M
		Destructive interference occurs at <i>Q</i> .	1 M
	(iv)		2 M + 1 M
6.	(a)	(i) clockwise	1 M
		No current	1 M
		anti-clockwise	1 M
	(b)		1 M + 1 M
		from $t=0$ to $t=0.1 \text{ s}$: 18.8 mA	1 M
		from $t=0.1 \text{ s}$ to $t=0.3 \text{ s}$: 0 mA	1 M
		from $t=0.3 \text{ s}$ to $t=0.6 \text{ s}$: 18.8 mA	1 M
7.	(a)	20 ± 1.8	1 M + 1 A
	(b)	(i) 4.55 A	1 M + 1 A
		(ii) 75.8%	1 M + 1 A
		No, the transformer is not ideal.	1 M
	(iii)	Using <u>laminated soft-iron core</u> can <u>reduce the eddy current</u> induced.	1 M + 1 A
		Using <u>thicker wire</u> can reduce the <u>heating effect of the coil</u> .	1 M + 1 A
	(c)	The <u>output voltage</u> and power of the transformer <u>decrease</u> .	1 M
		Therefore, the lamp becomes <u>dimmer</u> .	1 M

				Marks
8.	(a)	(i)	$2.35 \times 10^{-10} \text{ min}^{-1}$	1 A
		(ii)	0.417 mol	1 A
		(iii)	73.8 min^{-1}	1 A
		(iv)	10200 yrs	1 M + 1 A
	(b)	(i)	A nuclear chain reaction is a fission reaction that <u>releases extra neutrons</u> .	1 M
			Thus the fission reaction could <u>maintain or self-propagate</u> .	1 M
		(ii)	$7.38 \times 10^{13} \text{ J}$	2 M + 1 A

Paper II
Section A: Astronomy and Space Science

1.	2.	3.	4.	5.	6.	7.	8.
B	A	C	B	C	B	A	C

			Marks
1.	(a)	White drafts of higher mass have <u>higher density</u> .	1 M
		According to the graph, white drafts of higher mass have <u>shorter radii</u> . Therefore, they have <u>higher densities</u> .	1 M
	(b)	19700 K	1 M + 1 A
	(c)	11100 K	2 M + 1 A
	(d)	2.58×10^8 N	2 M + 1 A

Section B: Atomic world

1.	2.	3.	4.	5.	6.	7.	8.
B	A	A	C	D	B	A	A

			Marks
2.	(a)	The electron is able to revolve in certain stable orbits around the nucleus without radiating any energy. The angular momentum of electrons at the stable orbits equals the multiples of $\frac{h}{2\pi}$.	1 M + 1M
	(b)	1 : 1	2 M + 1 A
	(c)	(i) $1.097 \times 10^7 \text{ m}^{-1}$	3 M + 1 A
		(ii) 656 nm	1 A

Section C: Energy and Use of energy

1.	2.	3.	4.	5.	6.	7.	8.
B	A	C	B	A	C	D	B

			<u>Marks</u>
3.	(a)	1400 m ²	1 M + 1 A
	(b)	39.6 m	1 M + 1 A
	(c)	(i) 235 MeV	1 M + 1 A
		(ii) a moderator is a medium that <u>reduces the speed of fast neutrons</u>	1 M
		(iii) the <u>reactor quickly runs hotter and hotter</u> , until some other factor slows the reaction rate such as the water (as a moderator) flashes to steam and the reactor shutdown.	1 M
	(d)	- saving electricity such as turning off unneeded electrical appliance or installing LED lighting tools.	1 M + 1 M
		- using massive transports or electric vehicles	
		- use less fossil fuel	
		(or any reasonable answers)	

Section D: Medical Physics

1.	2.	3.	4.	5.	6.	7.	8.
C	A	D	C	B	B	C	C

			<u>Marks</u>
4.	(a)	$414.8 \text{ kg m s}^{-1}$	1 A
	(b)	$1.46 \times 10^6 \text{ kg m s}^{-1}$ or $1.63 \times 10^6 \text{ kg m s}^{-1}$	2 M +1 A
	(c)	0.08% (1:1250)	1 M +1 A
	(d)	(i) The resolution increases with the frequency	1 M
		(ii) Acoustic impedance of the body tissue.	1 M
	(e)	A-scan record the amplitude while B-scan record the brightness	1 M +1 M