HKDSE MOCK EXAMINATION 2025

Physics

Marking Scheme

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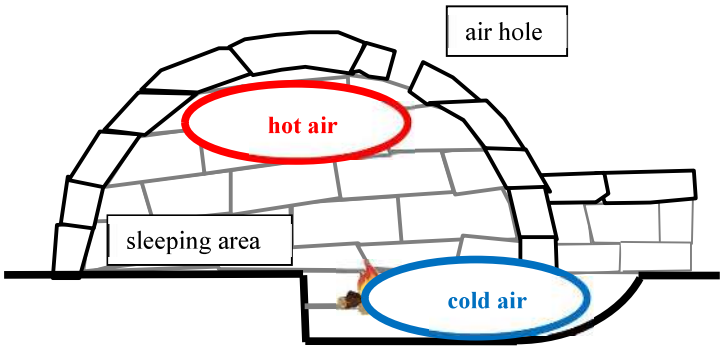
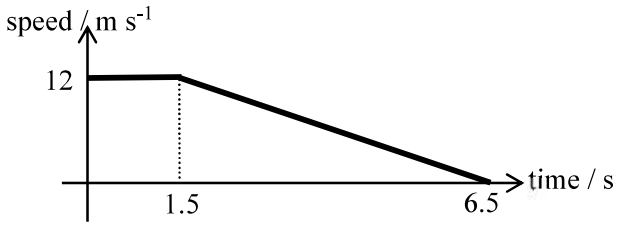
Paper I Section A

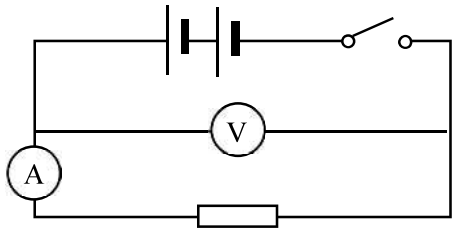
Question No.	Key	Question No.	Key
1.	B	26.	C
2.	B	27.	C
3.	A	28.	C
4.	D	29.	B
5.	B	30.	C
6.	D	31.	C
7.	C	32.	A
8.	D	33.	D
9.	A		
10.	D		
11.	B		
12.	B		
13	A		
14.	A		
15.	B		
16.	C		
17.	C		
18.	B		
19.	B		
20.	D		
21.	D		
22.	A		
23.	C		
24.	A		
25.	C		

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
	(b)	(i)		1 A + 1 A
		(ii)	Hot air is <u>less dense</u> therefore it <u>floats up to the top</u> of the igloo.	1 M
			Cold air is <u>denser</u> therefore it <u>sinks down the bottom</u> of the igloo.	1 M
	(c)		The air hole on the top of the igloo <u>allows air to enter</u> which <u>avoids suffocation</u>.	1 M
2.	(a)	(i)	16.0 mol	1 M + 1 A
		(ii)	1.07×10^5 Pa	1 M + 1 A
	(b)		The volume of capillary tube is neglected.	1 M
			Nitrogen is an ideal gas.	1 M
3.	(a)	(i)	58.86 J	1 M + 1 A
		(ii)	19.62 J	1 M + 1 A
	(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)		6.5 s	1 M + 1 A
				2 M

Marks

5.



1 M

First, connect the circuit as shown in the diagram

Measure the electromotive force (ε) of the battery using the voltmeter while the switch is open. 1 M

Next, close the switch to complete the circuit, allowing current to flow, and measure the current (I) using the ammeter. 1 M

Simultaneously, measure the terminal voltage (V) across the battery using the voltmeter. 1 M

Finally, the internal resistance (r) of the battery can be calculated using the equation:

$V = \varepsilon - Ir$ (or $r = \frac{\varepsilon - V}{I}$) 1 M

6. (a) 4 : 5 (5 : 4 is accepted) 1 M + 1 A

(b) F + F + F = mg+ mg

F = 2mg/3 1 M + 1 A

Take moment at *P*

F(d) + F(0.5) + F(3.2)= mg(0.6) + mg(2) 1 M

d = 0.2 m 1 A

7. (a) Since path difference of C, $\Delta x_c = S_1C - S_2C = 0$ m, 1 M

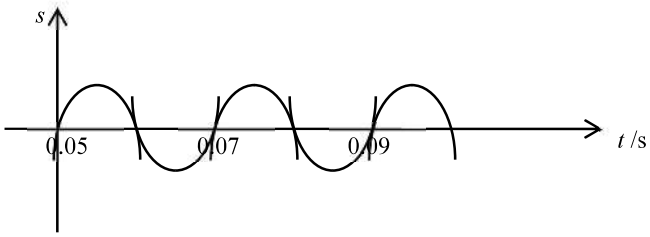
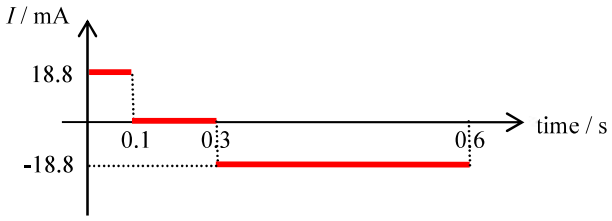
constructive interference occurs at *C*. 1 M

(b) $\lambda = \frac{c}{f} = \frac{3\times10^8}{5\times10^{14}} = 600$ nm 1 M

$\Delta y = \frac{\lambda D}{a} = \frac{(6\times10^{-7})(0.8)}{6\times10^{-5}} = 8\times10^{-3}$ 1 M

$y_B = \left(2 - \frac{1}{2}\right)\Delta y = 1.5(8\times10^{-3})$ 1 M

$\therefore y_B =$ 0.012 m 1 A

				Marks
8.	(a)		Put some sponge at the edge of the ripple tank.	1 M
	(b)		The wave produced by the dot vibrator transfers to all direction and the wavefront is always perpendicular to the propagation direction.	1 M + 1 M
	(c)	(i)	4 cm	1 A
		(ii)	2 m s^{-1}	1 A
		(iii)	$\Delta x_P = 0$ cm	1 A
			$\Delta x_Q = 3$ cm	1 A
			Constructive interference occurs at P.	1 M
			Destructive interference occurs at Q.	1 M
		(iv)		2 M +1 M
9.	(a)	(i)	clockwise	1 M
			No current	1 M
			anti-clockwise	1 M
	(b)			1 M + 1 M
			from t =0 s to t =0.1 s : 18.8 mA	1 M
			from t =0.1 s to t =0.3 s : 0 mA	1 M
			from t =0.3 s to t =0.6 s : 18.8 mA	1 M
10.	(a)		20 : 1	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 laminated soft-iron core can reduce the eddy current induced.	1 M + 1 A
			Using thicker wire can reduce the heating effect of the coil.	1 M + 1 A
	(c)		The output voltage and power of the transformer decrease.	1 M
			Therefore, the lamp becomes dimmer.	1 M

				Marks
11.	(a)	(i)	2.35×10^{-10} 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 releases extra neutrons.	1 M
			Thus the fission reaction could maintain or self-propagate.	1 M
		(ii)	7.38×10^{13} 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 higher density.	1 M
		According to the graph, white drafts of higher mass have shorter radii. Therefore, they have higher densities.	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 obits equals the multiples of $\frac{h}{2\pi}$.	1 M + 1M
	(b)		1 : 1	2 M + 1 A
	(c)	(i)	$1.097 \times 10^7\ m^{-1}$	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

				Marks
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 reduces the speed of fast neutrons	1 M
		(iii)	the reactor quickly runs hotter and hotter, 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. - using massive transports or electric vehicles - use less fossil fuel (or any reasonable answers)	1 M + 1 M

Section D: Medical Physics

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

				Marks
4.	(a)		414.8 kg m s^{-1}	1 A
	(b)		1.46 x 10^6 kg m s^{-1} or 1.63 x 10^6 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