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EDITORS: enter new message below this line (also include time and TSR Username)

EDITORS: list your TSR Usernames on Page 2!

17:50 Z_GAMER
Anyone can comment!

16:27 Z_GAMER
editors, list your TSR usernames here so when ppl want to edit UOMS but they don't have access, you can edit it in for them by tagging you in the TSR Chat

16:24 Z_GAMER
exact words of google doc when i try to approve requests: Sorry, you have exceeded your sharing quota.

16:19
Google Docs says i have already reach the limit of the quota for sharing - Z_GAMER

16:15
After exploring the possible graphs, discuss it in the TSR EXAM CHAT - Z_GAMER

16:14
check textbooks, revision guides and web pages to figure put what does the graph actually supposed to look like! - Z_GAMER

16:10
If you disagree with the graph, feel free to write your concerns in the TSR exam chat! - Z_GAMER

15:45
Graph had been uploaded! - Z_GAMER

15:39
i'm adding the graph on rn! - Z_GAMER

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14:58

i need to go for 30 mins. sorry for the inconvenience. - Z_GAMER

14:53

Graph have been sent in, but as i'm using an imac, i'm trying to find a way to upload it on the the doc.i can download it to photos, but have to put it in files in order to get uploaded on here. - Z_GAMER

14:45

window for requests is currently closed as Google doc won't let me accept anymore requests. But dw, i'm trying to find a way to get around it so enrollment for editing can be opened again! - Z_GAMER

14:42

please send the correct graph to tsrexams95@gmail.com and i will gladly attach the graph on to the UOMS for you! - Z_GAMER

17:54

I think the graph question is for question 6

2

TSR USERNAME OF EDITORS

- Z_GAMER
- hat25
- yspahi
- Al3x235

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OCR A A-Level Physics Paper 3 Unofficial Mark Scheme

	Question	Answer	Working	Any objections?	Marks
Q1	a) Place an X where the acceleration of the MAVEN is maximum.	a) The closest point to mars b) Orbits mars in an elliptical orbit with the center of mars		For part c did anyone get the value of the constant to be around 7.3×10^{-11} or something yh i got this - this was when you	a) 1 mark b) 2 marks

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	b) State how Kepler's first law applies to MAVEN's orbit. c) Prove the relationship in Kepler's 3rd law using the data from the table. d) Why would the scientists choose for MAVEN not to have an areostationary orbit. (reasons)	as one of its foci c) $T^2/R^3 = \text{constant}$ d) orbit is close to Mars and time period is shorter		converted it all into metres and seconds right? i got 9 suttin bro d) The time period of MAVEN's orbit is not the same as the Aerostationaty orbit d) I simply put it is not on the equator of Mars ? d) i said the rotation of maven might not be the same direction as Mars yay klm part b i stated the first law and said its velocity is greatest towards Mars slower the further from Mars. what do you lot think?	c) 3 marks d) 2 marks
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Q2	Resistivity a) How to calculate diameter b) How did they work out mean and uncertainty c) rearrange the equation d) Work out resistivity using the gradient of the graph, don't need to include uncertainty. e) Work out r + uncertainty don't believe this was for that question, may be confusing this with the 3d printer question	a) Use a micrometer/vernier caliper, measure the diameter at diff points b) Take out the outlier of 4.9 and then sum the four values and divide by 4 to find the mean, then the uncertainty is half the smallest measurement you can make on the calipers divided by 2 as its analog. g c) Use $\text{Emf} = I(R+r)$ $1/I = (R+r)/\text{Emf}$ $1/I = (R/\text{Emf}) + (r/\text{emf})$ $1/I = ((PL)/A)/\text{emf} + r/\text{emf}$ $1/I = (P/\pi \text{ emf } d^2/4)L + r/\text{emf}$ $1/I = (4P/\pi \text{ emf } d^2)L + r/\text{emf}$ as required d) gradient = $(4P/\pi \text{ emf } d^2)$ rearrange for resistivity. 1.63×10^{-3} ohmmetre e) y intercept = internal resistance/emf Multiply y intercept by emf To find uncertainty do the same for worst fit line and then take away from the actual value. something about internal resistance so the voltage isn't equal to the emf.	+_ 0.5 to 1sf i got 0.02...	i liked this one same lightwork b) absolute unc. = range/2 Will also get u to unc. +- 0.005	a) 2 marks b) 3 marks c) 3 marks d) 2marks e) 4 marks
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		for uncertainty i got something like ± 0.02 ish. i got 0.580 ± 0.5 correct sigs like the question (absolute uncertainty always to the same number of d.p.s as the value, i got like ± 0.48) f)		I got 0.58 ± 0.12 or something. I used the graph and found the worst fit y intercept and found percentage uncert then found abs uncert as a result. percentage uncert was 27%	
Q3	Terminal velocity a) What is terminal velocity b) Why is mist appear to be floating? use the equation to explain. c) Explain an experiment that will allow you to verify the equation. Calculate the slowest terminal velocity i think $\frac{2 \times g \times r^2 \times (P(s) - P(l))}{9 \times \text{coefficient}}$	a) when droplet is at rest in cloud only 1 force is acting on it (weight), as soon as droplet starts falling down the speed of the droplet increases, which in turn progressively increases the magnitude of the drag force opposing weight, when the weight of the droplet = drag force then the droplet has reached terminal velocity, where the velocity is momentarily constant and there is zero acceleration. idk lol b) From what ive seen either r of mist particles is almost 0 so top of fraction is almost 0, or density of mist is close to density of air so top of fraction is	Is that the pag where you drop the balls into a tube with bands placed at set distances along the tube?	C) for the minimum velocity i got 0.075 C) I somehow got 0.03 ,using the material in second in third row couldn't rmb what they are sorry the radius was 0.5mm and the coefficient was 50×10^{-3}, i think is was im pretty sure it was it was $\frac{(2 \times 9.81 \times (0.5 \times 10^{-3})^2 \times (7800 - 920))}{9 \times 50 \times 10^{-3}}$ which gives u 0.074992	a) 3 marks b) 2 marks c) 6 marks

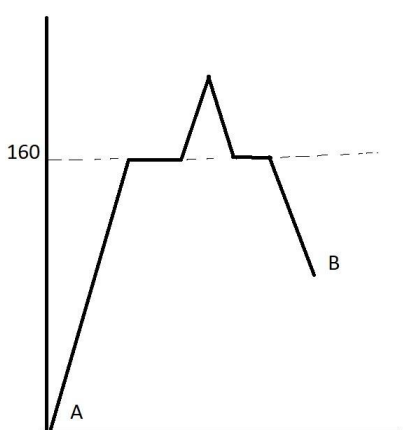
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		c)PAG 1.2 terminal velocity . you measure the time between each band until its the same from one to the next to increase accuracy measure horizontally from the measuring tube and record with a camera to get a more exact value for the time.			
	Nuclear Fusion 400MJ 12KW	$E = mc^2$ change in m = mass of He + n - mass of Deuterium - mass of tritium Then find E 400×10^6 divided by E	1.4×10^{20}		
Q4	a) Calculate the capacitance of the system	a) something like 1.39? i got 1.3, i think i got 1.4 1.4 seems right b) a capacitor can discharge	a)$E = P \times t$ $E = \frac{1}{2} V^2 C$ Rearrange for C	there wasnt a value of time though how did you use $e=pt$ same i tried to make the gradient look about the same B) a high energy get a high current	a) b) 2 c)3

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	b) Why is the capacitor used not the main power supply 1 millisecond, (had to use calculation) c) Work out the energy that you would need to make from fusion to get the same amount of energy d)	very quickly? also won't deteriorate like a normal power supply. c) 	c) $E = \text{change in } mc^2$	which is dangerous, so a capacitor slow down rate of energy released ? like this? yhh yes boy why the second peak? and then goes back into a phase tranformation , wut? I put the second peak in in my exam but i dont think its right. Surely it would just be a straight horizontal line at 160 and then the downwards diagonal back to B?	
Q5	Star a) How does a neutron star form b) What is one property of a neutron star c) show that the density of	a) Red supergiant explodes in a type II supernova, if remaining core is greater than 1.44M but less than 3M a neutron star will form b) rotates rapidly, density similar to that of the nucleus (e.g. very dense)? Low luminosity as well i think c) both the neutron star and		is saying very dense for part b enough I said that too i said its dense as the protons and electrons fuse i think thats enough How did people do the area under the graph i was sat there for 5 mins doing trapeziums? Yeah I did trapeziums and got like $\times 10^{-24}$ alr good i just did the area as a triangle, cuz it was only 2 marks	a) 2 marks b) 1 mark c) 4 d) 2 e) 35555

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	the neuron star is similar to that of a nucleus	the nucleus should have a density of about 4×10^{17}		can u say collapse instead of explode in part A	
d) Area under graph to estimate total received at satellite	d) around 1.1×10^{-24}	d) Number of small squares is about 44. Area per small square = $0.5 \times 10^{-22} \times 0.5 \times 10^{-3} = 2.5 \times 10^{-26}$ Area under graph = $44 \times 2.5 \times 10^{-26} = 1.1 \times 10^{-24}$			
e) calculate the total energy output by neutron star	e) around 3.99×10^{11} f)	e) Total energy output by neutron star = $[(S.A. \text{ at } 300 \text{ pc}) / (S.A. \text{ of satellite})] \times (\text{Energy received at satellite calculated in the previous question})$ = $[4\pi(300 \times 3.1 \times 10^{16})^2] / 3000 \times 1.1 \times 10^{-24}$ = around 3.99×10^{11} (ecf from part d)		E) i got something like 10^{11} e) i did by ratio $((SA \text{ at } 300 \text{ pc}) / 3000) = (\text{unknown } E / \text{answer in previous part })$ To get around 10^{12} Don't know if it is right Intensity is inversely proportional to distance squared so this is wrong. it should be 4×10^{19}	

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Q6	a) Define the specific latent heat of fusion b) Work out mass c) Why is the time smaller than previous answer? d) something about the high energy x-ray photons producing an electron and positron e) draw a graph from A to B f) Outline the process of a PET scan and CAT scan. Give some advantages and disadvantages of using these scans yh the skin cancer or whatever it also mentioned something beginning with a b like bolor or smthn Bolus which is a highly radiating source used to target skin cancer cells	a) the energy required per unit mass to change the state of a substance from solid to liquid at a constant oil temperature	e) Advantages: -can differentiate between soft tissues of similar attenuation coefficients -FDG accumulates in tissues with a high rate of respiration e.g. tumors -can detect tumor size and location -3d image and 3D printer uses a 3D image to produce a model. -good resolution -non invasive technique, no broken skin so no chance of infection Disadvantages: - expensive - time consuming	a) b) we[	d) 2 e) 6
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			high levels of ionizing radiation which itself can cause cancer For PET scanse using particle accelerators, which is inconvenient (as fluorine-18 has a halflife or 110 mins) and expensive.		
	Total marks			Should be 70 so we can see what marks / questions we are missing	