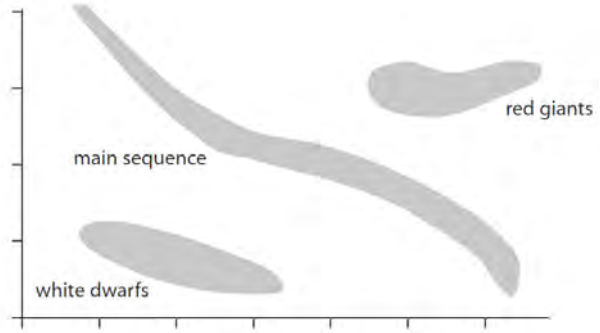
Mark Scheme (Results)

Summer 2021

Pearson Edexcel International GCSE

In Physics (4PH1) Paper 2P

Question number	Answer	Notes	Marks
1 (a) (i)	B – main sequence stars; A is not correct as black holes do not appear on the HR diagram C is not correct as neutron stars are not part of the main sequence. D is not correct as protostars are not part of the main sequence		1
(ii)	bottom left area of the HR diagram;	unlabelled scores 0	1
(iii)	top right hand area of HR diagram;  	unlabelled scores 0	1
(iv)	a measure of brightness/luminosity; idea that a star would be at a standard distance (10 parsecs/32(.6) light years);	accept power ignore lack of or incorrect value for distance	2
(b) (i)	C – ultraviolet; A is not correct as microwaves cause internal heating B is not correct as radio waves do not give skin burns D is not correct as visible light cannot harm skin cells.		1
(ii)	A – sunbathing; B, C and D are not correct as all reduce the absorption of UV by skin.		1

Total for Question 1: 7 marks

Question number	Answer	Notes	Marks
2 (a)	300 (metres);		1
(b)	0.554; any answer given to 2 sf; correct answer = 0.55 (s) e.g. (0.50+0.62+0.52+0.58+0.55)/5 = 0.554 (s) = 0.55 (s) to 2 s.f.	mark independently	2
(c)	difference in distance is 180 m; recall of equation: speed = distance / time taken; substitution; correct evaluation; correct answer = 330 (m/s) e.g. speed = (300 – 120)/0.55 speed = 180/0.55 speed = 327.2727… (m/s)	 allow use of standard symbols e.g. v = d/t condone s for v, s for d ECF incorrect distance and ECF incorrect time from (b) answer is 327.2727… (m/s) answer is 324.90… (m/s) if 0.554(s) is used	4
(d)	human reaction time;	 accept alternative valid variables e.g. wind speed, temperature, humidity, air pressure	1

Total for Question 2: 8 marks

Question number	Answer	Notes	Marks
3 (a)	insulator;	Allow 'non/not conductive'	1
(b)	any reference to electron transfer; loss (of electrons);	 idea of 'loss of electrons (from tube)' scores 2. reject any reference to movement of positive charges	2
(c)	electrons move through wire; as they are attracted by or to the metal mast; idea that this makes metal mast neutral (again);	 allow idea of 'opposite charges attracting' allow idea of 'to earth/earthing the mast' if no other mark scored	3
(d)	recall of equation energy = charge × voltage; substitution or re-arrangement; evaluation; correct answer = 860 (V) e.g. energy = charge × voltage voltage = energy/charge = 3.7/0.0043 voltage = 860.465… (V) voltage = 860 (V)	allow use of standard symbols e.g. E = Q × V reject C,c for charge -1 for PoT error	3
(e)	spark/discharge; damage/harm/injury/electrocution (of engineer);		2

Total for Question 3: 11 marks

Question number	Answer	Notes	Marks
6 (a)	creation of a (large) nucleus from small **nuclei**; resulting in a loss of mass; and the release of energy;	condone "fusing of two nuclei" accept reference to $E=mc^2$ condone "converted to energy"	3
(b) (i)	electrical working;	condone 'electrically'	1
(ii)	substitution in $V_{in}I_{in} = V_{out}I_{out}$; re-arrangement; evaluation; correct answer = 1.8 (kA) e.g. input power = output power $V_{in}I_{in} = V_{out}I_{out}$ $28 \times 21 = 330 \times I_{out}$ $I_{out} = (28 \times 21) \div 330$ I_{out} =1.7818...	-1 POT error	3

Total for Question 6: 7 marks