

STAR CYCLE AND GALAXY MARK SCHEMES

| Question 1 | | | |
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| question | answers | extra information | mark |
| (a)(i) | gases(1) gravity (1) | correct order essential for credit | 2 |
| (a)(ii) | Fusion | | 1 |
| (a)(iii) | Billions | | 1 |
| (b) | Milky Way | U.c. initials not essential | 1 |
| Total | | | 5 |
| Question 2 | | | |
| (a) | gravitational attraction | accept 'gravity' accept (nuclear) fusion | 1 |
| (b) | <u>radiation 'pressure'</u> and gravity / gravitational attraction | must be in correct context | 1 |
| | are balanced / in equilibrium or there is sufficient / a lot of hydrogen / fuel to last a very long time / for (nuclear) fusion | accept are equal <u>and opposite</u> do not accept 'equal' do not accept constant supply of hydrogen this mark only scores if linked to the supply of hydrogen / fuel reference to burning negates both marks | 1 |
| (c)(i) | (conversion of) hydrogen <u>to</u> helium by (nuclear) <u>fusion</u> | accept (conversion of) lighter elements to heavier elements | 1 |
| | | note do not credit spelling of 'fusion' which could be 'fission' | 1 |

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| | | reference to burning negates both marks | |
| (d) | distributed throughout the Universe / space | do not accept Solar System for Universe | 1 |
| Total | | | 7 |
| Question 3 | | | |
| (a) | dust space | accept solid (s) accept from supernova / supernovum / supernovas | 1 1 |
| (b) | By atoms joining together | only one ticked or otherwise unambiguously identified | 1 |
| (c) | Milky Way (galaxy) | | 1 |
| (d) | The answer depends on beliefs and opinions, not scientific evidence. | only one ticked or otherwise unambiguously identified | 1 |
| total | | | 5 |
| Question 4 | | | |
| (a) | gravitational | accept gravity do not accept weight | 1 |
| (b)(i) | planet(s) | accept comet(s) accept asteroid(s) do not accept moon(s) | 1 |
| (b)(ii) | balanced | accept equal / the same / are in equilibrium | 1 |

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| (b)(iii) | Milky Way | accept milky way | 1 |
| Total | | | 4 |
| Question 5 | | | |
| (a)(i) | the bigger the <u>masses</u> (of the dust and gases then) the bigger the force / gravity (between them) | accept the converse | 1 |
| (a)(ii) | the greater the distance (between the dust and gases then) the smaller the force / gravity (between them) | accept the converse | 1 |
| (b) | <p><u>radiation 'pressure'</u> and gravity / gravitational attraction these are balanced / in equilibrium</p> <p>or</p> <p>there is sufficient / a lot of hydrogen / fuel to last a very long time</p> | <p>must be in correct context do not accept are equal</p> <p>second mark consequent on first</p> | 1 1 |
| (c) | <p>any two from:</p> <ul style="list-style-type: none"> • hydrogen runs out / is used up • nuclei larger than helium nuclei formed | accept bigger atoms are formed however do not accept any specific mention of an atom with a mass greater than that of iron | 2 |

| | | | |
|--------------|--------------------------------------------------------------------------------------------------------|--|----------|
| | <ul style="list-style-type: none">• (star expands to) / become(s) a <u>red giant</u> | | |
| Total | | | 6 |