Edexcel A2 Physics

Target sheet for Chapter 7 Astrophysics and cosmology

Statement	Spec ref	Comments
use the expression $F = Gm_1m_2/r^2$	126	
derive and use the expression $g = -Gm/r^2$ for the gravitational field due to a point mass	127	
recall similarities and differences between electric and gravitational fields	128	
recognise and use the expression relating flux, luminosity and distance $F = L/4\pi d^2$ and the application to standard candles	129	
explain how distances can be determined using trigonometric parallax and by measurements on radiation flux received from objects of known luminosity (standard candles)	130	
recognise and use a simple Hertzsprung-Russell diagram to relate luminosity and temperature. Use this diagram to explain the life cycle of stars	131	
recognise and use the expression $L = \sigma T^4$ x surface area, (for a sphere $L = 4\pi r^2\sigma T^4$) (Stefan-Boltzmann law) for black body radiators	132	
recognise and use the expression: $\lambda_{max}T = 2.898 \times 10^{-3}$ m K (Wien's law) for black body radiators	133	
recognise and use the expressions $z = \Delta\lambda/\lambda \approx \Delta f/f \approx v/c$ for a source of electromagnetic radiation moving relative to an observer and $v = H_0 d$ for objects at cosmological distances	134	
be aware of the controversy over the age and ultimate fate of the universe associated with the value of the Hubble Constant and the possible existence of dark matter	135	
explain the concept of nuclear binding energy, and recognise and use the expression $\Delta E = c^2\Delta m$ and use the non SI atomic mass unit (u) in calculations of nuclear mass (including mass deficit) and energy	136	
describe the processes of nuclear fusion and fission	137	
explain the mechanism of nuclear fusion and the need for high densities of matter and high temperatures to bring it about and maintain it	138	