Question number	Answer	Notes	Marks
7 (a)	Cosmic Microwave Background Radiation (CMBR) (Cosmological) Red shift of <u>galaxies</u>	Allow one missing word Accept reference to Hubble's Law. Allow higher level idea of ratio of hydrogen to helium as alternative to either marking point.	2
(b)	<u>CMBR</u> MAX TWO from MP1 CMBR appears to be the same in all directions/is everywhere; MP2 Which implies all parts of the Universe were in contact a long time ago; MP3 Wavelength has increased as the universe has expanded; MP4 universe was (significantly) hotter long ago; <u>Red Shift of Galaxies</u> MAX TWO from MP5 The further the galaxy is from Earth, the greater the red-shift; MP6 The greater the red-shift, the faster the galaxy is moving away; MP7 Speed of galaxies increases (is directly proportional to) with increased distance; MP8 Relationship between speed and distance implies expansion from a single point or since the Big Bang;	Allow implication of idea of coming from single point Allow frequency has decreased Allow RA Condone "star" for "galaxy" for MP5 Allow 'red shift' for 'speed of galaxies' Allow 'galaxies moving apart from each other' for 'relationship between speed and distance'	4