

# Red Shift and Big Bang 1 MS

## QUESTION 1

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	red shift	accept Doppler effect	1
a)ii)	the universe is expanding		1
b)i)	big bang		1
b)ii)	at the moment it is the best way of explaining.....		1
Total marks			4

## QUESTION 2

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	line shifts towards red end of spectrum wavelength (appears) to increase  galaxy is moving away (from the Earth) or galaxy moving away from initial point	do not accept reference to 'red light' do not accept 'red shift' as a stand alone response  do not accept universe expanding  do not accept planet on its own	1 1  1
b)i)	light from A has a greater red shift	accept light from A is more red do not accept reference to blue light	1
b)ii)	3600 (million light years)	allow 1 mark for showing that the line  could be extended or allow 1 mark for the correct use of a point on the line	2
Total marks			6

### QUESTION 3

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	Universe began at a (very) small (initial) point 'explosion' sent matter outwards or 'explosion' causing Universe to expand	'it' refers to Universe  accept gas / dust for matter accept rapid expansion for explosion	1  1
a)ii)	light shows a red shift  galaxies moving away (from the Earth)	owtte the term red shift on its own does not  score a mark 'it' refers to light 'they' refers to galaxies accept star for galaxy do not accept planet for galaxy	1  1
b)	check reliability / validity of data  amend theory or discount the data	accept check data accept collect more data accept replace old theory with new theory	1  1
c)	answer involves (religious) belief or no / insufficient evidence	accept it cannot be tested	1
Total marks			7

### QUESTION 4

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	Models can help to explain an effect or theory.		1
b)i)	(moving) loudspeaker represents the (moving) galaxy the decrease in frequency of the sound is like red-shift	accept sound waves represent light waves accept increase in frequency is like blue-shift accept answers in terms of wavelength change accept sound going away from you is like red-shift	1  1

		accept red-shift happens when galaxies / stars move away (from Earth) this accept only scores if first marking point scores	
b)ii)	Big bang theory		1
Total marks			4

### QUESTION 5

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	Y  shows Universe expanding  from a (very small) point	accept cannot be X as size is increasing this scores if Y or Z is chosen accept exploding outwards this only scores if Y is chosen accept from zero (size) answers in terms of planets negate the last two mark points	1  1  1
b)i)	both the 'big bang' and 'steady state' theories		1
b)ii)	(new) evidence that supports / disproves a theory or (new) evidence not supported by current theory	accept proves for supports  accept there may be more  evidence supporting one (theory) than the other (theory) accept new evidence specific to this question eg measurement of CBR or some types of star only found in distant parts of Universe (steady state suggests should be same throughout Universe)	1
Total marks			5

**QUESTION 6**

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	away (from each other)	accept away (from the Earth) accept receding	1
b)	distance (from the Earth) speed galaxy is moving	accept how far away (it is)	1 1
c)	(Universe is) expanding		1
Total marks			4