Global water stores and changes in magnitude 3.1.1.2 ANSWERS

Q1	Match the terms with their water state			
Α	Fresh and saline water largely in a liquid state	Hydrosphere		
В	Liquid water contained within soil, may sometimes be frozen	Pedosphere		
С	Water in a solid state. May be liable to melting into a liquid form	Cryosphere		
D	Liquid water contained in rocks, may occasionally be frozen	Lithosphere		
Е	Water vapour plus condensation of fresh water and may be frozen	Atmosphere		
	Lithosphere Cryosphere Atmosphere Hydrosphere	Pedosphere		

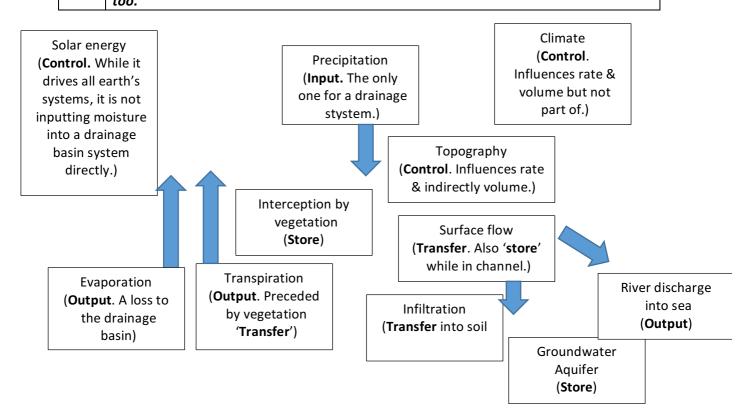
Q2	Tick if these are primarily water Transfers, Stores – or Both	Transfer	Store	
Α	Evaporation	✓		
В	Underground aquifer		✓	
С	Ice sheet		✓	
D	Percolation	✓		
Е	Precipitation	✓		
F	Glacier	✓	✓	
G	River	✓	✓	
While water is frozen within a moving glacier or contained within a river channel it is a transfer, but held within a consistent state – so also a store, though far more temporary in the case of a river.				

Q3	Place a + (increase) or (decrease) in the pairs of stores under the following change conditions		
		Water store	Change + /
А	A glacial advance (ice maximum)	Cryosphere	+
		Hydrosphere	-
Ice-	sheets and glaciers extend their range. The flow of rivers to t	he sea reduces as wa	ter is locked into a
	solid state so sea level falls	S	
В	Global warming	Atmosphere	+
		Cryosphere	-
Αv	varmer planet will increase evaporation and put more water	vapour into the atm	osphere while ice-
	sheets and glaciers reduce in size as	they melt	
С	An interglacial (warm phase between ice advances)	Pedosphere	+
		Lithosphere	+
As ic	e-sheets melt and the ground unfreeze, infiltration into the s	oil and percolation of	of much melt-water
	will recharge groundwater sto	ores	
D	A prolonged drought	Hydrosphere	-
		Atmosphere	+ then -
Lal	kes and rivers will evaporate faster than they are replenished	, reducing the hydro	sphere. Increased
ev	aporation will initially put moisture into the atmosphere, but	t as sources dry up, t	his later reduces.
E	Human water abstraction for irrigation from bore wells	Lithosphere	-
		Atmosphere	+
F	Removing water from underground stores reduces that held i	n rocks. By placing tl	he water on the
	face it is likely to be evaporated (it is irrigation water after al		

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Q4	4 Given that global warming is occurring, what are the likely changes in the		
	following water stores, why and with what consequences?		
Cryosphere		Hydrosphere	
Will get smaller as snow and ice melts under		River flow and ocean levels are likely to	
warmer	atmospheric and ocean	increase as glacier and snow-melt are more	
temperatures. Sea-ice is less likely to form.		rapid. Increased evaporation is likely to	
River flow will increase initially from glacier-		regulate the rate of sea level rise, but the	
melt, in	creasing the hydrosphere (possibly	latter is likely to be much greater, leading to	
leading to localised flooding of flood plains).		threats to coastal communities from more	
But later, loss of glaciers may cause severe		frequent flooding and infiltration of saline	
water shortages in communities that rely on		water into the lithosphere at the coast.	
this wat	er source in the Andes and Himalayas.		
	Atmosphere	Lithosphere	
	ed evaporation is likely to occur as	The underground stores of water take much	
conditio	ons become warmer, increasing the	longer to absorb the higher temperatures in	
atmospheric moisture content. However, this		the atmosphere. The volume is likely to	
is likely to be balanced by greater		increase from greater surface flow (glacier	
	ation rates as cloud-formation occurs	melt and more frequent rainfall) with more	
more regularly. Heavy rainfall will be an		percolation resulting to add to their store. On	
	ed output from atmospheric water is it	the other hand, there is likely to be an	
	a new equilibrium state. It is likely to	increase in human abstraction of ground	
result in increased, and more intense flooding		water supplies that may reduce them at an	
	e regions.	even faster rate of depletion.	

Classify these elements in a drainage basin system as 'input', 'store', 'flow/transfer' or 'output'. Some are independent of the system and are 'controls'. Identify those too.



Q5