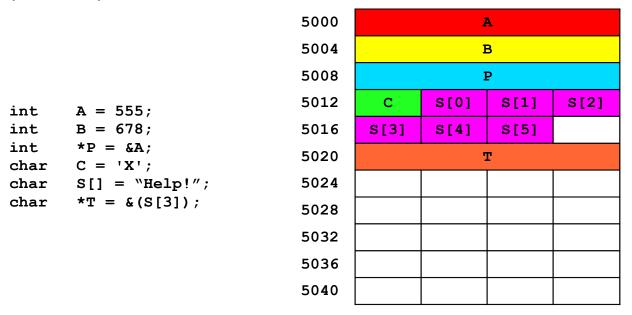## Problem ST-5 (2 parts)　　　　　　　　　　　Pointers and Arrays

Assuming a 32-bit system with 32-bit memory interface and 32-bit addresses, answer the following questions. The following variables are allocated in memory beginning at address 5000.

Part A (10 points) Complete the memory map below with the variable names at each word or byte in memory. Do not include the variable's value.

```
int    A = 555;
int    B = 678;
int    *P = &A;
char   C = 'X';
char   S[] = "Help!";
char   *T = &(S[3]);
```

Addr				
5000	A			
5004	B			
5008	P			
5012	C	S[0]	S[1]	S[2]
5016	S[3]	S[4]	S[5]	
5020	T			
5024				
5028				
5032				
5036				
5040				

Part B (16 points) Using the variables in part A, give the values of each expression. Assume expressions are non-cumulative (i.e., they follow the declarations). Answers may be characters.

P	5000	*P	555	S	5013	T	5016
*(P+1)	678	&C	5012	*(S+1)	'e'	T[-2]	'e'

Compare variables **S** and **T**. Are they interchangeable? Why or why not?

Both variables can be used as arrays or pointers. T can be modified.

S is a constant and cannot be modified.