Assignment for System Programming

Answer any 3 questions 3 X 10 = 30

1. Write a sequence of instructions for SIC to clear a 20-byte string to all blanks. 10
2. Write a subroutine for SIC/XE that will read a record into a buffer. The record may be any length from 1 to 100 bytes. The end of record is marked with a "null" character (ascii code 00). The subroutine should place the length of the record read into a variable named LENGTH. Use immediate addressing and register-to-register instructions to make the subroutine as efficient as possible. 10
3. Generate the object code for each statement in the following SIC/XE program:

```
SUM       START   0
FIRST     LDX     #0
          LDA     #0
          +LDB    #TABLE2
          BASE    TABLE2
LOOP      ADD     TABLE,X
          ADD     TABLE2,X
          TIX     COUNT
          JLT     LOOP
          +STA    TOTAL
          RSUB
COUNT     RESW    1
TABLE     RESW    2000
TABLE2    RESW    2000
TOTAL     RESW    1
          END     FIRST
```

10

4. Suppose that routines that are brought into memory by dynamic loading need not be removed until the termination of the main program. Suggest a way to improve the efficiency of dynamic linking by making it unnecessary for the operating system to be involved in the transfer of control after the routine is loaded. 10
5. What kind of errors might occur during bootstrap loading? What action should the bootstrap loader take for such errors? Modify the SIC/XE bootstrap loader algorithm to include such error checking. 10