1. Consider the following:

A: PROGRAM;
DECLARE SDC SCALAR DOUBLE CONSTANT(.3);
DECLARE VDC VECTOR DOUBLE CONSTANT(.1, .2, .3);
STRUCTURE STR RIGID:
   1 STR_SDC SCALAR DOUBLE;
DECLARE STR STR-STRUCTURE CONSTANT(.3);
DECLARE SD SCALAR DOUBLE INITIAL(.3);
DECLARE ID INTEGER DOUBLE INITIAL(2);
DECLARE ONE SCALAR INITIAL(1);
DECLARE RESULT ARRAY(6) SCALAR DOUBLE;
RESULT$1 = ONE .3;
RESULT$2 = ONE SDC;
RESULT$3 = ONE SD;
RESULT$4 = ONE ID;
RESULT$5 = ONE STR_SDC;
RESULT$6 = ONE VDC$3;

Which of the above assignment statements use a single precision multiplication (if any) and which use a double precision multiplication (if any)? Circle either 'SP' or 'DP'.

RESULT$1 = SP  DP
RESULT$2 = SP  DP
RESULT$3 = SP  DP
RESULT$4 = SP  DP
RESULT$5 = SP  DP
RESULT$6 = SP  DP

2. Consider the following:

X: COMPOOL RIGID;
DECLARE A ARRAY(3) SCALAR INITIAL(1,2,3);
DECLARE S SCALAR INITIAL(4);
DECLARE I INTEGER INITIAL(5);
DECLARE J INTEGER INITIAL(6);
CLOSE;
After program Y executes, what are the values of A, I, and J?

A = 
I = 
J =

3. Consider the following:

A: PROGRAM;
REPLACE SWAP(X,Y) BY
"TEMP = X; X = Y; Y = TEMP";
DECLARE SCALAR, X,Y,Z,TEMP;
TEMP = 0;
X = 1;
Y = 2;
Z = 3;
SWAP(Z,X);
CLOSE;

a. After program A executes, what are the values of X, Y, Z, and TEMP?

b. How would the HAL/S compiler expand SWAP(Y,X)?

4. In the following HAL/S statement, how many halfwords of memory will the variables I and J use?

DECLARE I, J INTEGER;

I = _____ HW(s)

J = _____ HW(s)
5. Consider the following:

    X:  COMPOOL RIGID;
        STRUCTURE S RIGID;
        1 SI INTEGER,
        1 SS SCALAR DOUBLE,
        1 SB BIT(16);
        DECLARE S S-STRUCTURE(2) INITIAL(1,2,HEX'3456');
        CLOSE;

What is the size of this compool in halfwords?

6. Consider the following:

    X:  COMPOOL RIGID;
        DECLARE C CHARACTER(7) INITIAL('ABCDEF');
        DECLARE SP SCALAR INITIAL(1);
        DECLARE NS NAME SCALAR DOUBLE;
        DECLARE NR NAME ARRAY(3) INTEGER REMOTE;
        CLOSE;

What is the size of C, SP, NS, NR and the entire compool in halfwords?

    C  = _____ HW(s)
    SP = _____ HW(s)
    NS = _____ HW(s)
    NR = _____ HW(s)
    X  = _____ HW(s)
7. Consider the following:

A: 
PROGRAM;
DECLARE I SCALAR INITIAL(200);
DECLARE C INTEGER DOUBLE INITIAL(1);
DECLARE F INTEGER DOUBLE INITIAL(2);
C = CEILING(I**2 + .5);
F = FLOOR(I**2 + .5);
CLOSE;

a) After program A executes, what’s the value of C?

b) After program A executes, what’s the value of F?

8. Consider the following:

A: 
PROGRAM;
DECLARE COUNT INTEGER INITIAL(0);
DECLARE B BIT(3) INITIAL(BIN’000’);
COUNT = 0;
IF B = OFF THEN COUNT = COUNT + 1;
B = ON;
IF B = BIN’111’ THEN COUNT = COUNT + 10;
IF B = TRUE THEN COUNT = COUNT + 100;
IF B = BIN’1’ THEN COUNT = COUNT + 1000;
IF B$1 = BIN’1’ THEN COUNT = COUNT + 10000;
CLOSE;

After program A executes, what’s the value of COUNT?

9. Consider the following:

A: 
PROGRAM;
DECLARE COUNT INTEGER INITIAL(0);
DECLARE B BIT(3) INITIAL(BIN’111’);
COUNT = 0;
IF B = ON THEN COUNT = COUNT + 1;
B = OFF;
IF B = BIN’000’ THEN COUNT = COUNT + 10;
IF B = FALSE THEN COUNT = COUNT + 100;
IF B = BIN’0’ THEN COUNT = COUNT + 1000;
IF B$1 = BIN’0’ THEN COUNT = COUNT + 10000;
CLOSE;

After program A executes, what’s the value of COUNT?
10. Consider the following compool and procedure:

CMPOOL: COMPOOL RIGID;
   DECLARE CB BIT(16) CONSTANT(HEX'CAFE');
   DECLARE CBD BIT(32) CONSTANT(HEX'DEADBEEF');
   DECLARE CI INTEGER CONSTANT(1);
   DECLARE CID INTEGER DOUBLE CONSTANT(2);
   DECLARE CS SCALAR CONSTANT(3);
   DECLARE CSD SCALAR DOUBLE CONSTANT(4);
   DECLARE CV VECTOR CONSTANT(5,6,7);
   DECLARE CC CHARACTER(5) CONSTANT('THINK');
   DECLARE CAI ARRAY(2) INTEGER CONSTANT(8,9);
CLOSE;

D INCLUDE TEMPLATE CMPOOL
PROC: PROCEDURE;
   DECLARE B BIT(16) INITIAL(HEX'FADE');
   DECLARE BD BIT(32) INITIAL(HEX'DEFEACED0');
   DECLARE I INTEGER INITIAL(1);
   DECLARE ID INTEGER DOUBLE INITIAL(2);
   DECLARE S SCALAR INITIAL(3);
   DECLARE SD SCALAR DOUBLE INITIAL(4);
   DECLARE V VECTOR INITIAL(5,6,7);
   DECLARE C CHARACTER(5) INITIAL('4 HWS');
   DECLARE AI ARRAY(2) INTEGER INITIAL(8,9);
   B = CB;
   BD = CBD;
   I = CI;
   ID = CID;
   S = CS;
   SD = CSD;
   V = CV;
   C = CC;
   AI = CAI;
CLOSE;

a) What is the size of CMPOOL (#PCMPOOL)?

b) What is the size of the local data area for PROC (#DPROC)?

c) While working a chit for STS-99, it becomes necessary to write a GMEM to change the constant CI. What is the name of the CSECT to be patched (assume that PROC is the only module that references CI)?