K201:  The Computer in Business

Second Departmental Exam (A)

March 9, 1982

Signature _____ *key* _____

Name _____

Student Number _____

Instructor's Name _____

Section Number _____

This exam is worth 100 points.  Although
ample time is allowed, the student is
advised to allocate his time wisely.  If
your response to a question requires more
writing area, continue you response on
the reverse of the page.

If you require assistance, raise your hand
and a proctor will assist you at your seat.

The following questions are worth 3 points each.

**A** 1. Diagnostic error messages provided by the compiler

    a. result from FORTRAN syntax errors that make it impossible to translate the program into a workable computer program.
    b. indicate that test data should be used to find the source of the error.
    c. result from a mistake in the deductive reasoning process used to design the program.
    d. result when the network of decisions in the program does not properly isolate the conditions that may arise.

**B** 2. The format specification used to print the variable TØT whose value is 44226.1 is F7.2. What kind of output will be printed for this specific data field?

    a. IIIIIII
    b. ******
    c. 44226.10
    d. XXXXXXX

**D** 3. Debugging is

    a. the method used to collect the data that will be used by your program.
    b. defining the data that a FORTRAN program can use.
    c. the process of translating a FORTRAN program into a machine language program.
    d. the process of detecting and correcting errors in your program.
    e. none of the above

**C** 4. Which of the following statements contain an error?

    a. DØ 30 J=1,LAX
    b. DØ 40 M=20,45,11
    c. DØ 26 I=J,K,X
    d. IF(X+2..EQ.Y-2.) GØ TØ 20
    e. none of the above

**C** 5. The STØP statement

    a. indicates to the compiler that the entire program has been read and that translation may proceed.
    b. must come at the physical end of each program.
    c. causes the computer to terminate running the current program and allows it to proceed to the next program.
    d. is a nonexecutable statement.
    e. is all of the above.

**E** 6. The documentation package for a computer program should include

    a. a description of the input and output files.
    b. a flowchart and a program listing.
    c. the variable names used in the program and a copy of the test data used with the results.
    d. instruction on how to run or use the program and a description of what the program does.
    e. all of the above.

_E_ 7. A sequence of statements that are executed repetitively for a specified number of times is a(n)

    a. DO loop.
    b. uncontrolled loop.
    c. count-controlled loop.
    d. condition-controlled loop.
    e. both a and c.

_C_ 8. Subscripts for an array

    a. can be any FORTRAN variable.
    b. can be any integer number.
    c. <u>must</u> be in integer mode.
    d. both a and c.

_B_ 9. Parameters are used in a program to

    a. create a program that is easy to document for future use.
    b. make the program more applicable to a variety of situations without modifying the program.
    c. simplify the debugging process.
    d. complicate the program for security reasons.
    e. both c and d.

_C_ 10. Program maintenance is the process of

    a. re-punching cards as they become too worn to be read by the card reader.
    b. modifying the data collection and data entry system when new situations arise so that the program can be used with no changes.
    c. changing or modifying programs from time to time to keep them up-to-date and useful.
    d. assuring the operation of the computer by periodic scheduled maintenance of the CPU.
    e. none of the above.


The following question is worth 8 points.

11. Consider the following array X:

    $X_1 = 5.2$       $X_4 = -2.0$       $X_7 = -8.1$
    $X_2 = 3.1$       $X_5 = 6.7$       $X_8 = 10.0$
    $X_3 = 0.$        $X_6 = 0.$

    a. What statement is necessary to reserve memory space in the computer for the array X?

        _DIMENSION X(8)_          2 pts

    b. Specify the value of each of the following array elements if K=2:

      i. X(K)= _3.1_         iii. X(5-K)= _not allowed_

      ii. X(3*K)= _0._         iv. X(K-3)= _undefined_

             1.5 pts each
             (round up at end of exam)

The following questions are worth 4 points each.
In each of the following questions specify the value of each variable indicated
after completion of the set of commands.

12.
```
        K=0
        DØ 40 L=1,3
        DØ 40 M=2,5,3
     40 K=K+L+M
```
K=____33____ (4 pts)

13.
```
        A=10.
        DØ 10 J=5,10
     10 A=A+10.
```
J=__undefined__ (2 pts)

A=____10.____ (2 pts)

14.
```
        N=20
        DØ 25 K=4,12,2
        N=N-K
        IF(N.LE.7) GØ TØ 40
     25 CØNTINUE
     40 X=N
```
X=____2.____ (2 pts)

K=____8____ (2 pts)

15.
```
        KAT=0
        DØ 20 L=2,8,2
     20 KAT=KAT+L
```
KAT=____20____ (2 pts)

L=__undefined__ (2 pts)

No partial credit except
as noted.

(30 pts)  16.  Given the following problem, provide a detailed flowchart that fully represents the problem.

I have a book of students' names, ages, sex, and scores.  A male has a sex code of 1, a female a 2.  I want an output that prints a line for each male in the class, giving his name and the average of his scores.  Also, you are to print the total number of males and the average age of the males.
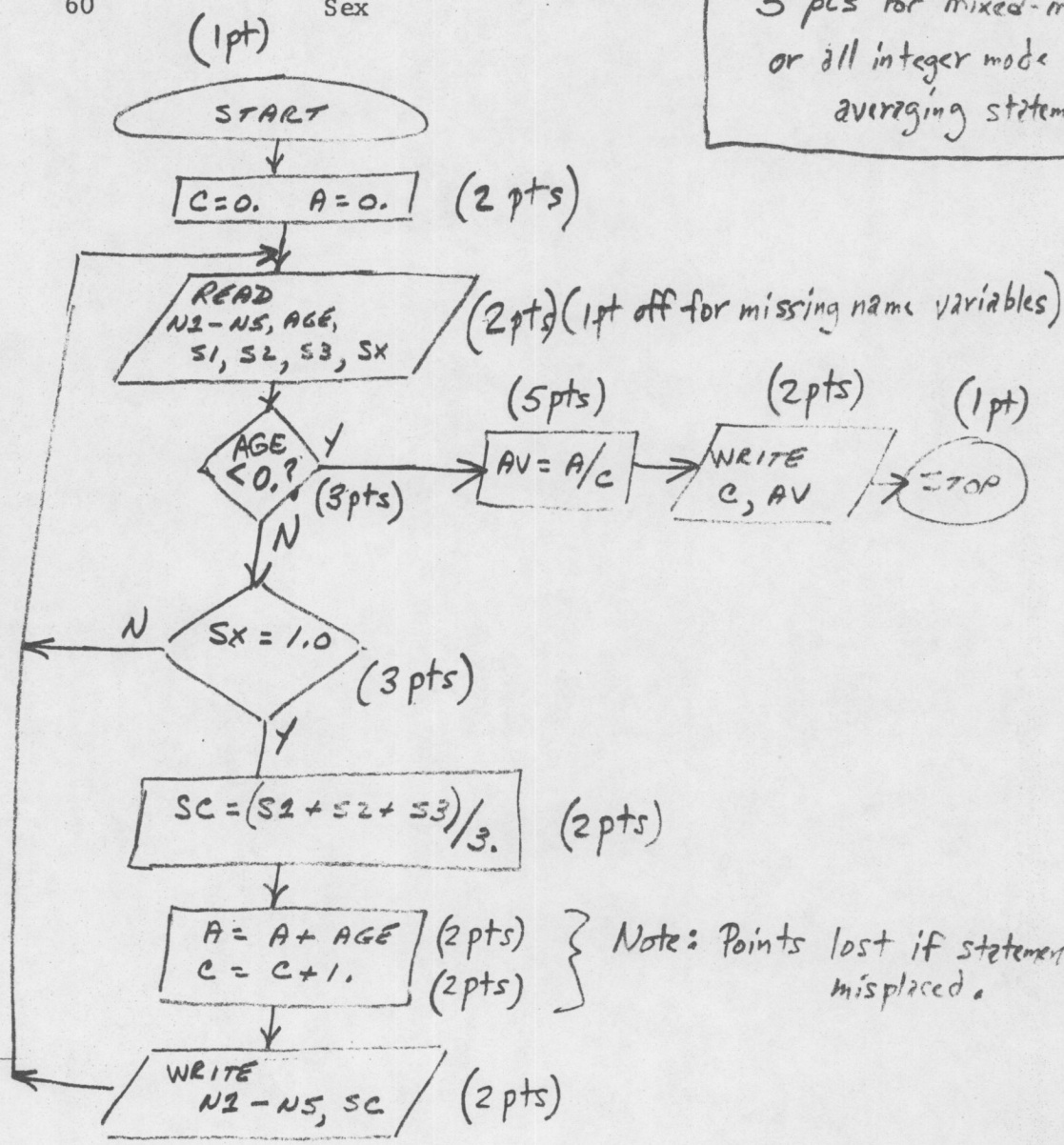
The input looks as follows.

**Add: Negative age card added at end of data deck.**

| Card Column | Description |
|-------------|-------------|
| 1–20 | Name |
| 25–26 | Age |
| 30–35 | Score 1 |
| 40–45 | Score 2 |
| 50–55 | Score 3 |
| 60 | Sex |

2 pts / computation
2 pts / input-output
3 pts / decision
5 pts for AV out of order

3 pts for mixed-mode or all integer mode on averaging statement

(1pt)

START

$C = 0. \quad A = 0.$   (2 pts)

READ
N1–N5, AGE,
S1, S2, S3, Sx   (2 pts) (1 pt off for missing name variables)

AGE < 0.?   (3pts)

Y → $AV = A/c$  (5 pts) → WRITE C, AV  (2 pts) → STOP  (1 pt)

N

Sx = 1.0   (3 pts)

N →

Y

$SC = (S1 + S2 + S3)/3.$   (2 pts)

$A = A + AGE$   (2 pts)
$C = C + 1.$   (2 pts)

} Note: Points lost if statements misplaced.

WRITE
N1 – N5, SC   (2 pts)

All points lost for box if mixed mode (except for averaging box) or incorrect path

Also: 3pts. off for any missing line

(16 pts) 17. Coding from a flowchart

Consider the following input cards with the following layout.

| Card Columns | Variable Name |
|---|---|
| 1-5 | ISN (Integer) |
| 6-10 | R (XX$_\wedge$XXX) |
| 17-23 | Z (XXXXX$_\wedge$XX) |

The following flowchart computes an average "AVE" which is to be printed at the top of a new page beginning in print position 10 in the following form:

AVERAGE EQUALS XXXXX.XX

On the coding form provided, write a complete FORTRAN program to implement the flowchart.
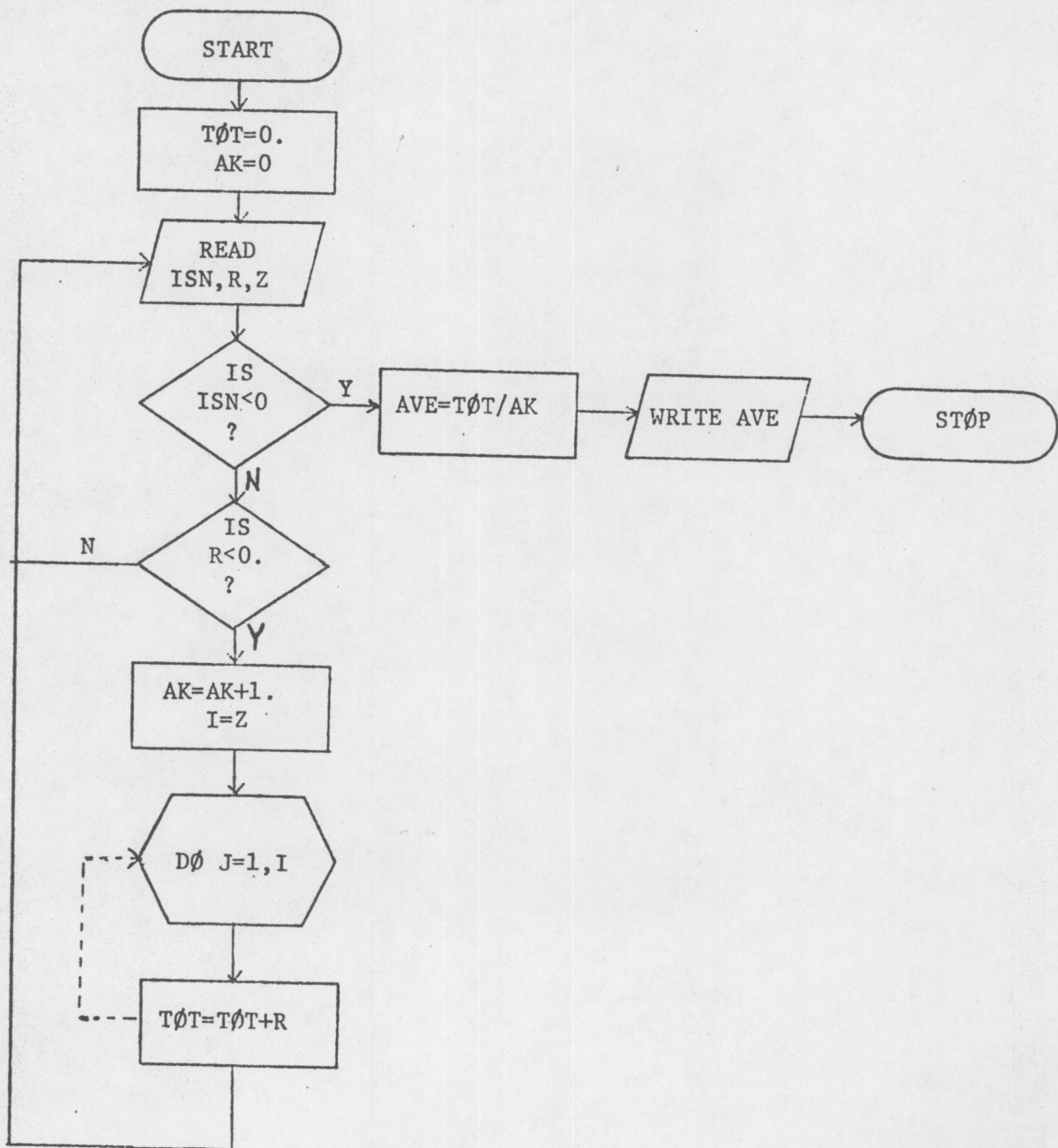
## FORTRAN STATEMENT

| Statement Number | | FORTRAN Statement | Points |
|---|---|---|---|
| | | TOT = 0.0 | } 1 pt. |
| | | AK = 0.0 | |
| 90 | | READ(5,1) ISN, R, Z | } 1 pt. |
| 1 | | FORMAT(I5, F5.3, 6X, F7.2) | } 2 pt. |
| | | IF(ISN.LT.0) GO TO 900 | 1 pt. |
| | | IF(R.LT.0.0) GO TO 100 | 1 pt. |
| | | GO TO 90 | 1 pt. |
| 100 | | AK = AK + 1.0 | 1 pt. |
| | | I = Z | } 1 pt. |
| | | DO 101 J = 1, I | 2 pt. |
| | | TOT = TOT + R | 1 pt. |
| 101 | | CONTINUE | 1 pt. |
| | | GO TO 90 | 2 pt. |
| 900 | | AVE = TOT/AK | 1 pt. |
| | | WRITE(6,2) AVE | } 1 pt. |
| 2 | | FORMAT(1, 'AVERAGE EQUALS', F8.2) | } 2 pt. |
| | | STOP | |
| | | END | |

No partial credit within statement or group of statements