IUPUI
K502: Computer Tools

First Exam

June 5, 1982

Signature_____

Name_____

Student Number_____

Instructor's Name_____

This exam is worth 100 points.

Although ample time is allowed, the

student is advised to allocate his

time wisely. If yours response to a

question requires more writing area,

continue your response on the reverse

of the page.

If your require assistance, raise your

hand and a proctor will assist you

at your seat.

The following 14 multiple choice questions count 2 points each.

1. Which of the below is an invalid decimal constant?

   a) -.5
   b) -10,250.05
   c) -10.45
   d) 0.0
   e) none of the above

2. Which of the below is an invalid FORTRAN variable name?

   a) RUNING
   b) 2LIST
   c) CØMEØN
   d) NØW37
   e) none of the above

3. The term "software," as used in the computer field, refers to:

   a) any equipment made of rubber or soft plastic
   b) peripheral equipment for computers, such as printers, terminals and
      magnetic tape units
   c) magnetic tapes and floppy discs
   d) computer programs
   e) none of the above

4. Decimal mode is most appropriate for numbers used for:

   a) calculating
   b) subscripts
   c) counting
   d) identification
   e) none of the above

5. A FORMAT statement must be located

   a) just after the PRØGRAM statement
   b) immediately following the associated READ statement
   c) either immediately following or immediately preceding the associated
      READ statement
   d) at the end of the program
   e) none of the above

6. In the translation process each FORTRAN variable name is assigned to a(n)

   a) operation code
   b) data field
   c) job control command
   d) specific memory register
   e) none of the above

_____ 7. An I in a printed numeric data field in the output indicates:

    a. a decimal mode variable name was associated with an integer format specification.

    b. the number to be printed was too large to fit into the area specified by the formal specification.

    c. the program was terminated by a CPU error before printing the output.

    d. the computer has attempted to divide by zero in the process of producing that answer, but the result was only printed and not used in a computation.

    e. none of the above

_____ 8. A documentation package includes all of the following except:

    a. description of what the program does.

    b. input/output formats.

    c. flow chart.

    d. object program.

    e. test data with correct results.

_____ 9. Which of the following statements is correct?

    a. A FORTRAN program which was compiled may or may not run to a normal termination.

    b. Test data are used to detect syntax errors.

    c. A FORTRAN program that could not be compiled may or may not run to a normal termination.

    d. A syntax error may be caused by not providing for an end-of-data check.

    e. none of the above

_____ 10. The format specification used for printing a variable whose value is 15.9 was F4.2. What kind of output will be printed for this specific data field?

    a. 15.90

    b. 1.59

    c. X

    d. ****

    e. none of the above

_____ 11. In which phase of the process of program development are the programs first run with actual data?

    a. operation and maintenance

    b. conversion

    c. flowcharting

    d. debugging

    e. documentation

_____ 12. Indicate which of the following FORMAT statements could be correctly used with the statement: READ (5,2), IT, X, Y, Z

    a) 2 FØRMAT (2I3, 3X, F3.0, 1X, F4.4)

    b) 2 FØRMAT (I6, A2, 2F4.0, I2)

    c) 2 FØRMAT ('0', I5, 2X, 3F4.0)

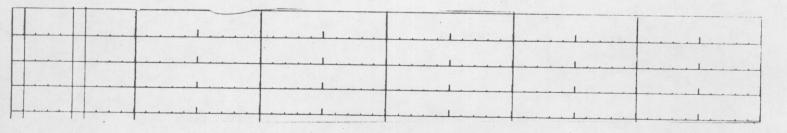   d) 2 FØRMAT (2A4, F6.6, 2X, F3.2)

    e) none of the above

13. A FORTRAN statement that is translated into one or more machine language instructions is called a(n)

    a) invalid statement
    b) non-executable statement
    c) comment statement
    d) executable statement
    e) none of the above

14. Which of the following arithmetic statements is incorrect?

    a) JAZZ = (JARR - JAM)/JEAN + 4
    b) XNØT = (U + V + W/(6.*X + Y)
    c) PRY = (PAN**.5 + PUT)**4
    d) XRAY = (M + N + L + J)*5 + 1
    e) none of the above

The following 6 fill in the blank questions count 2 points each.

15. The last statement in a FORTRAN program must be a(n) _____ statement.

16. In computer jargon, the abbreviation CPU stands for _____

_____ .

17. A group of adjacent card columns that holds a unit of data (such as an item number or a price) is called a(n) _____ .

18. A C in column 6 of the FORTRAN coding form identifies a(n) _____ line.

19. The computer program that is used to translate a FORTRAN program into a machine language program is called a(n) _____ .

20. Indicate how the number 14.152 would be punched in a card field with specification F8.4. The decimal point is not to be punched. Use the symbol Δ for a blank.

_____

21. In each of the following you are to follow through the sequence of calculations specified by the statements and specify the resulting value of the indicated variable.

(3 pts)   a) R=2.
               S=-3.
               T=2.
               A=(R**2+S**2)/4.*T

               A=_____

(2 pts)   b) I=7
               J=2
               K=3
               M=I/J*K

               M=_____

(3 pts)   c) X=7.
               Y=-5.
               Z=3
               N=2.*X+Y/2.+Z

               N=_____

22. Translate each of the following mathematical expressions into an equivalent FORTRAN expression.

(3 pts)   a) $\sqrt{5-3T^2}$

(3 pts)   b) $\dfrac{A^{2K}}{5B}$

(3 pts)   c) $\dfrac{5K-3L}{2K^2+L}$

(5 pts) 23. Consider the following card layout.

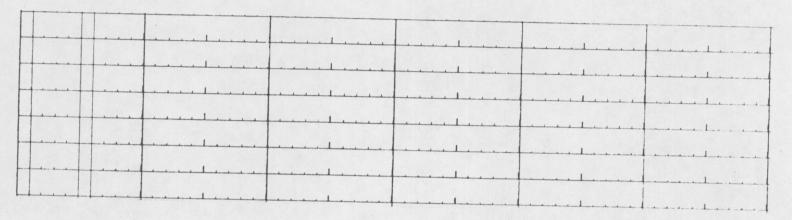| Card Columns	Description
5-12	Policy Number (Integer)
13-34	Name of Insured (Alphanumeric)
35-39	Premium Amount (XXX$_\wedge$XX)
45-49	Amount of Policy (XXXXX$_\wedge$)

On the following coding form, write the FORTRAN statements necessary to read the above card and assign the appropriate variable names to the data fields.

(5 pts) 24. Consider the following report headings to be printed at the top of a new page.

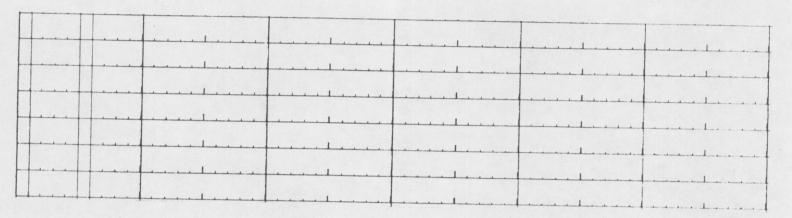| 1	11	21	31
PØLICY	NAME ØF		AMØUNT ØF
NUMBER	INSURED		PØLICY

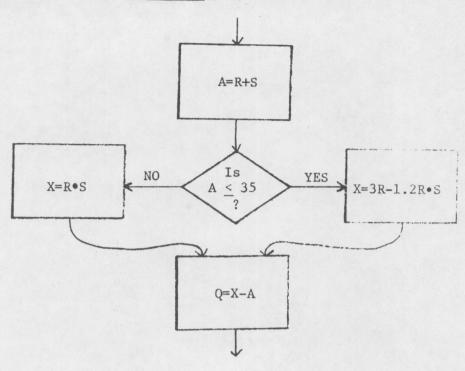On the following coding form, write the FORTRAN statements required to pring the above headings.

(5 pts) 24. Consider the following report headings to be printed at the top of a new
page.

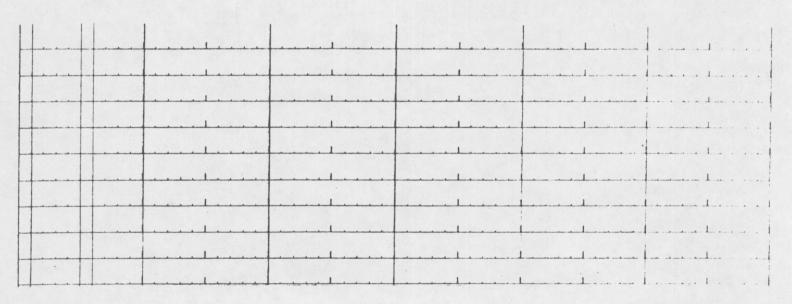| 1	11	21	31
POLICY	NAME OF		AMOUNT OF
NUMBER	INSURED		POLICY

On the following coding form, write the FORTRAN statements required to
pring the above headings.

(8 pts) 25. Consider the following <u>partial</u> program flow chart:

On the coding form below, write the FORTRAN statements corresponding to the above flow chart.

(20 pt) 26. For each employee in BEC company a card is punched with the following data:

Card column	Description	Form	Variable Name
5-11	Employee #	Integer	NE
15-19	Weekly gross pay	XXX$_\wedge$XX	GPE

The last card has a negative number in columns 1-6. Each week these cards are processed by computer to calculate net pay and print a line with employee number, gross pay and net pay for each employee. Also, some summary results are printed on a separate page after all the employees' cards are processed.

$$Net\ pay = gross\ pay - income\ tax$$

where: income tax is 10% of gross pay if gross pay is less than $250
is 15% of gross pay if gross pay is between $250 and $450 inclusive
is 20% of gross pay if gross pay is over $450

Prepare a flowchart for a program to calculate net pay, print a line for each employee, and print the number of employees with gross pay over $450 and their average gross pay.

(5 pts) 27. Describe the test data cards that would be required to debug the program
described in problem 26.