[redacted] Machine Tools

[redacted] Exam

June 10, 1982

Signature _____

Name _____

Student Number _____

Instructor's Name _____

This exam is worth 140 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 your response on the reverse of the page.

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

Each of the following 8 questions counts 2 points.

___ 1. The ACCØUNT card which we used in each of our lab programs is an example of what language?

a) Machine Language
b) BMD
c) FØRTRAN
d) job control language
e) None of the above

___ 2. How many memory registers would be reserved by the following DIMENSIØN statement?

```
DIMENSIØN A(4,5), B(30), C(100)
```

___ 3. The PRØBLM and FINISH cards are used in which of the following instances?

a) as FØRTRAN compiler cards
b) as FØRTRAN program cards
c) as job control language cards
d) as BMD parameter cards
e) there are no such cards

___ 4. Assuming all variables and indices have been defined, which of the following statements is incorrect?

a) WRITE(6,8) MY(I), DØG(J+2)
b) READ(5,2) K(N), X(I)
c) NØ(K+6) = SØN(2*I+3) - T
d) DIMENSION C(J),D(I)
e) none of the above

___ 5. The compiler is an example of:

a) Support software
b) Applications software
c) Communications software
d) Hardware
e) None of the above

___ 6. A canned program of the BMD package is an example of

a) a language translator
b) an applications program
c) an operating system
d) a service program
e) none of the above

___ 7. The initiation and termination of jobs to achieve minimum delay is the responsibility of:

a) the service programs
b) the operating system
c) the operator
d) the programmer
e) the data management programs

___ 8. Which one of the following does the operating system not do?

a) Controls operation of all hardware and software.
b) Controls multiprogramming - (the switching back and forth among the several programs stored in memory).
c) Gather user statistics.
d) Starts and stops jobs.
e) Translates programs into machine language.

(6 pts) 9. Consider a table composed of an array INUM of item numbers, an array PRICE of prices, and an array CØST of unit costs. We wish to look for the value of the variable NUM in the item number array so as to determine its price and unit cost.

NUM is called the _____.

INUM is called the _____.

PRICE and CØST are called _____.

10. Find the values of the indicated variables after the following statements have been executed.

(4 pts) a)

```
      X = 20
      DØ 51 I = 1,6
      XI = I
   51 X = X+2.*XI
```

XI = _____

(4 pts) b)

```
      JPRØ = 1.
      DØ 60 J = 3,8,2
      JPRØ = JPRØ *J
   60 CØNTINUE
```

JPRØ = _____

(6 pts) c)

```
      ITØT = 0
      DØ 61 I = 4,5
      ITØT = ITØT + 2*I
      DØ 62 J = 6,8
   62 ITØT = ITØT+I+J
   61 CØNTINUE
```

ITØT = _____

(4 pts) 11. You are given the following FORTRAN statements.

```
      K=0
      DØ 90 K=2,14,3
      DO 90 J=1,15,3
   90 K=K+1
```

How many times will the associated inner DØ loop be executed in total?

_____

12. The following questions refer to the array L.

$$L = \begin{bmatrix} 2 & 4 & 1 \\ 2 & 3 & 1 \end{bmatrix}$$

Find the value of the variables indicated.

(6 pts) a)

```
      K=0
      DØ 10 I=1,2
      DØ 10 J=1,3,2
      IF(L(I,J).EQ.2) K=K+1
      K=K+L(I,J)
   10 CØNTINUE
```

K=_____

(3 pts) b)

```
A=L(K,3) + L(2,3) + L(3,3)
```

A=_____

(3 pts) c) Write the FØRTRAN statement to reserve memory registers for the array L

_____

13. The following questions refer to the array N.

N= [2,4,6,3,5,7]

(4 pts) a)

```
      K=0
      DØ 10 I=2,8,2
   10 K=K+N(I)
```

K=_____

I=_____

(2 pts) b)

```
      J=3
      R=N(2*J-2)
```

R=_____

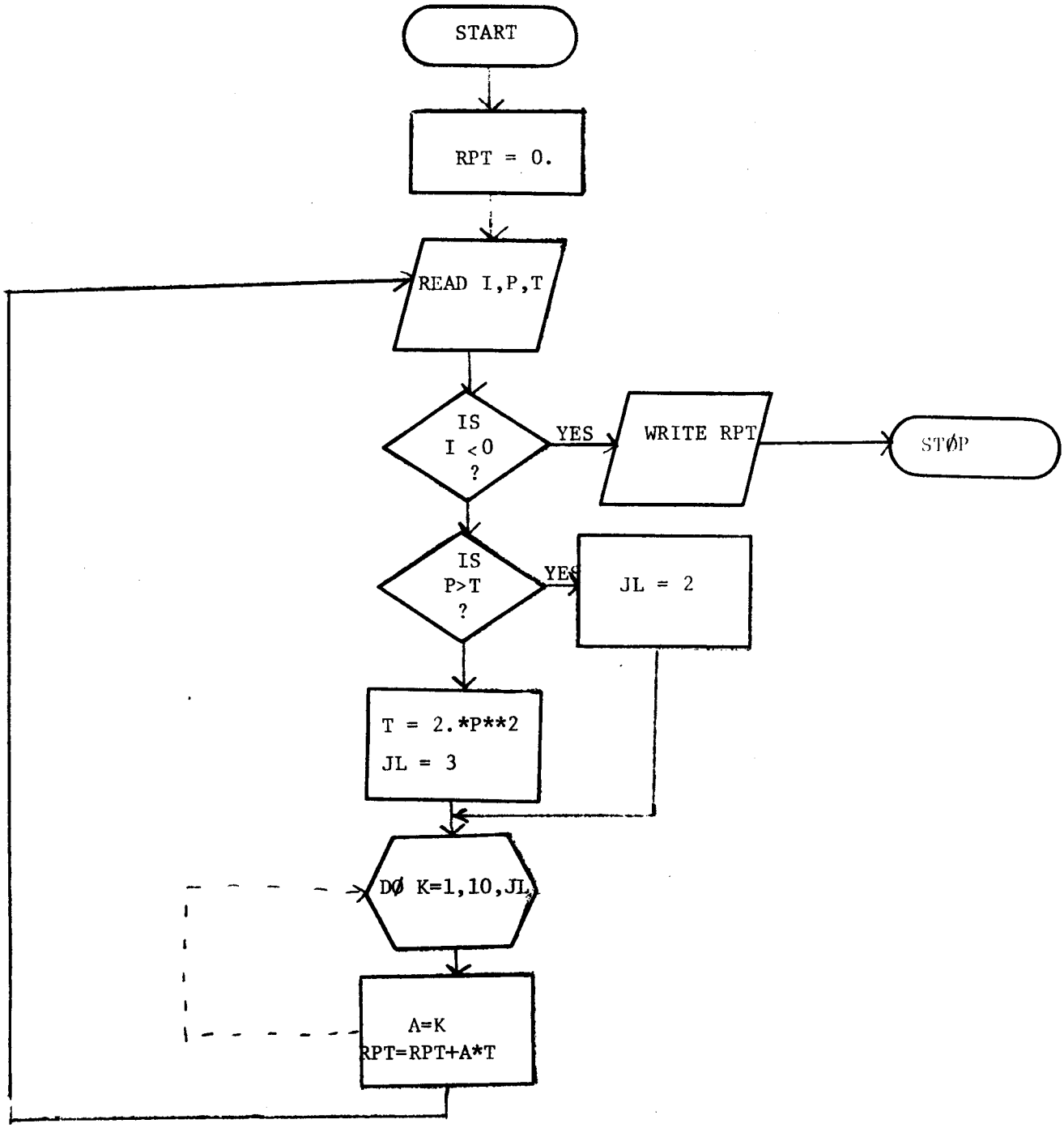
(25 pts) 14. Consider input cards with the following layout

Card Columns	Variable Name
1-5	I, Integer
6-9	P, (XXX$_\wedge$X)
10-13	T, (XX$_\wedge$XX)

The following flowchart computes a number RPT which is to be printed at the top of a new page beginning in print position 20, in the following form.

RPT IS = XXXXX.XX

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



NAME: PROJECT #: CARD COLOR: PAGE ___ OF ___ PAGES

DECK ID: DATE: TRANSCRIBED BY:

C FOR COMMENT

STATEMENT NUMBER 1–5	Cont. 6	FORTRAN STATEMENT 7–72	ID NUMBER 75–80

15. In this problem assume you work for an automobile insurance agency. You will be concerned with segments of a program that produces a bill for each customer.

(6 pts) a1) Initially you are given the layout for table cards which contain the following information.

Card Columns	Description
1-3	Insurance classification (integer)
6-11	semi-annual payment (XXXX^XX)
14-16	discount rate (X^XX)

Presently, there are 50 or less classifications that a driver can be placed in. The actual number of classifications, N, is punched in columns 1 and 2 of a parameter card which precedes the table cards.

Write the program segment that reserves memory and reads the parameter and table cards. Also set up an array ICØUNT (the same size as the other arrays) and initialize it to zero

(6 pts) a2) Design a flowchart for this part of the program!

(12 pts) b1) Once the above is completed we enter into the main loop of the program. Here we will read customer data cards with the following layout.

Card Columns	Description
1-24	Customer name (alphanumeric)
27-50	Customer address (alphanumeric)
53-55	Classification (integer)

(A negative 99 has been placed in columns 53-55 on the last card.) Use a table look-up to find the appropriate classification. Count the number of customers that fall into this category, then compute the customer's bill (bill = payment * discount rate). It is important to note that for each classification there is a corresponding discount that must be applied to arrive at the proper payment due. On every other line, print the customer's name, skip 10 spaces, write the address, skip 10 spaces and write their bill. Thus you are to write all the program statements from reading the data card down through and including branching back to read another card.

(7 pts) b2) Design a flowchart on the following page for this part of the program.

(6 pts) c) In the termination part of this program we wish to print the number of customers in each category, using the arrays for classification and ICØUNT. The output should be double spaced and printed in the following manner:

Print Position	Description
1-7	Insurance classifications (from array)
10-14	Number of customers (from array ICØUNT)

Finally terminate the program. Headings are not needed for this report.

(20 pts) 16. Consider the following inventory file whose layout is shown below. This file is on tape 14.

Position	Variable Name	Description
1-6	NUM	Item Number (Integer)
7-26	(provide your own)	Description (Alphanumeric)
27-31	PR	Unit Price ($XXX_{\wedge}XX$)
32-36	QTY	Quantity on Hand ($XXXXX_{\wedge}$)
37-41	D1	Demand this month ($XXXXX_{\wedge}$)
42-46	D2	Demand last month ($XXXXX_{\wedge}$)

Write a FORTRAN program that will read this file and rewrite it on Tape 16, eliminating the records for items that have had no demand during the past two months (Demand this month plus Demand last month equal to zero). Be sure and terminate this program properly. (You may want to prepare a program flow chart before writing this program.)