Name_____

E.W. Martin

K201 First Exam REVIEW

1. (12 points) Describe any errors in the following FØRTRAN statements. There may be no errors, one error, or several errors in each statement.

   a) A**2/3.*B = R1

   b) PRINT, WT, ID, 3*X, NUM

   c) IF(A.GE.30) GØ TØ END

   d) SUM = (2.A+3.B)**2.1

2. (12 points) Let K=3, L=7, M=2, W=3. and T=5.

   Evaluate the following statements:

   a) I = K+2/L-1 I = _____

   b) X = L/K*M X = _____

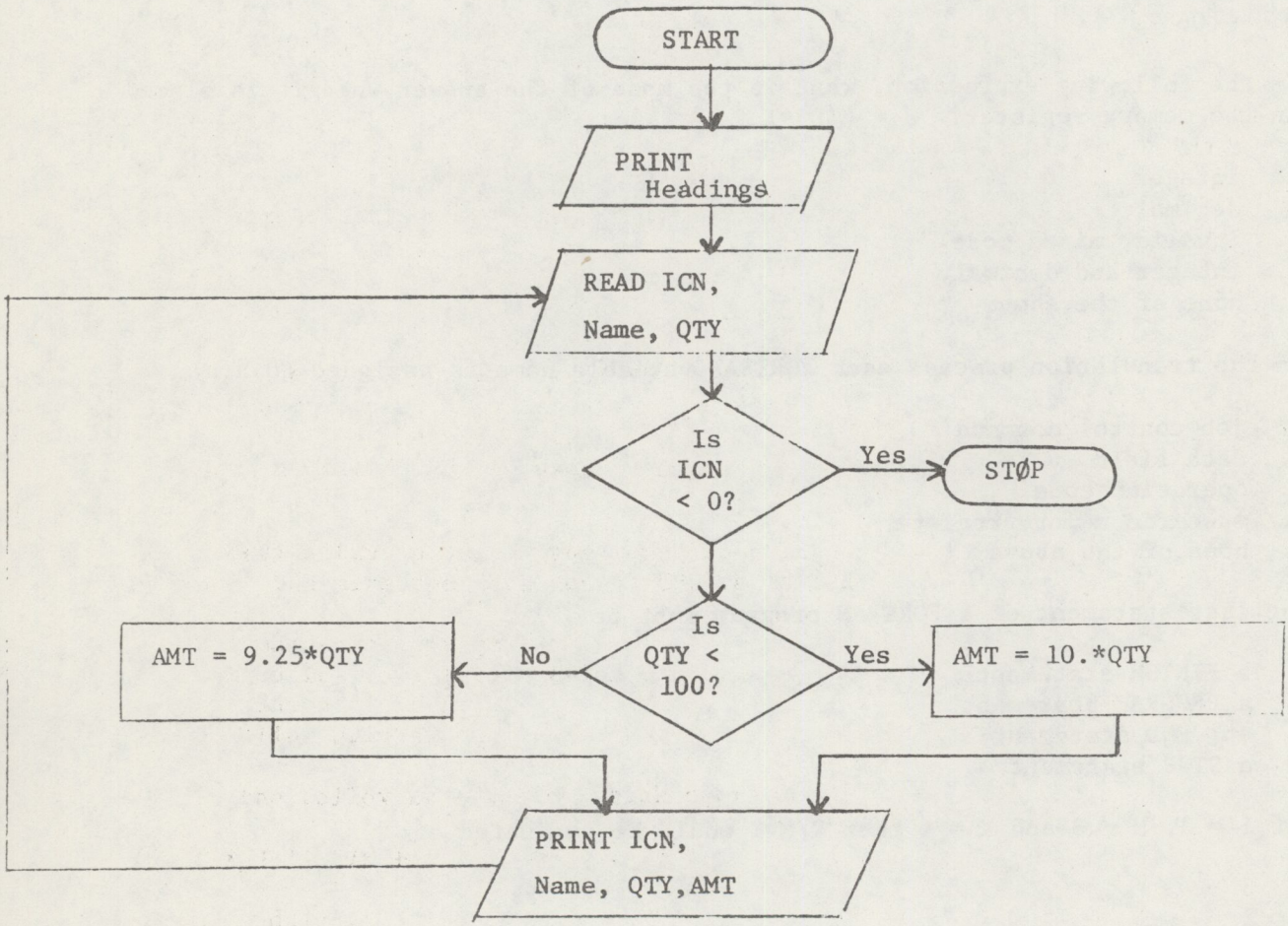
   c) Y = W**2+T**2/4.+T Y = _____

   d) N1 = 3.*W/T+2. N1 = _____

The output report lines should be printed (single spaced) as follows:

Print Positions	Variable Name	Form
3 - 7	ICN	Integer
10 - 29	Name	Alphanumeric
32 - 36	QTY	XXXX.
40 - 47	AMT	XXXXX.XX

The flow chart follows:



_____ 6. In order to execute FORTRAN progams a computer must have a FORTRAN

a. CPU
b. machine language
c. compiler
d. control unit
e. none of the above

_____ 7. Integer mode is most appropriate for numbers used for

a. measuring
b. identification
c. calculations
d. division
e. none of the above

_____ 8. INDIANA should be described as

a. an invalid decimal variable
b. an invalid integer variable
c. a valid integer constant
d. a valid integer variable
e. none of the above

_____ 9. Any character other than a 0 or blank in column 6 of the FORTRAN coding form indicates that

a. anything punched in columns 7 through 72 is a continuation of the preceeding statement
b. the statement number is too long
c. anything written on this line will be printed in the FORTRAN program, but will not be translated
d. columns 73-80 are used to continue this statement

_____ 10. A device that scans a typed or hand-printed form, recognizes the characters, and transmits the data to the CPU is called:

a. magnetic tape unit
b. optical character reader
c. computer terminal
d. line printer

_____ 11. In the following equation which operation is performed first?

(3* J)** 5/K + 5

a. adding 5
b. multiplication of 3 times J
c. exponentiation
d. division by K
e. none of the above

G. Resinovic

Name_____

K201-Quiz 4D
11/4/81

(10 pts) 1. We have 400 cards punched with the following layout:

card columns	Description
1-7	Item Number (Integer)
8-12	Quantity on Hand (XXXXX$_\wedge$)
13-17	Quantity on Order (XXXXX$_\wedge$)

At the beginning of a program we wish to read the cards and establish three arrays: the array INØ of item numbers, the array QØH of quantity on hand, and the array QØØ of quantity on order. On the coding form below write the FORTRAN statements required for this portion of a program.

```
      DIMENSIØN INØ(400),QØH(400),QØØ(400)
      DØ 5 I=1,400
    5 READ(5,2),INØ(I),QØH(I),QØØ(I)
    2 FØRMAT(I7,2F5.0)
```

G. Resinovic

Name_____

K201-Quiz 4D
11/4/81

(10 pts) 1. We have 400 cards punched with the following layout:

card columns	Description
1-7	Item Number (Integer)
8-12	Quantity on Hand (XXXXX^)
13-17	Quantity on Order (XXXXX^)

At the beginning of a program we wish to read the cards and establish three arrays: the array INØ of item numbers, the array QØH of quantity on hand, and the array QØØ of quantity on order. On the coding form below write the FORTRAN statements required for this portion of a program.

Name_____

Gortan Resinovic
1st Summer Session 1982

K201 Quiz 1B

1. (3 pts) ALU is a part of CPU and it stands for _____. Name 2 other functional parts of the CPU.

   _____

   _____

2. (2 pts) A compiler is a program that translates the _____language program into a _____language program.

3. (2 pts) When a program is compiled, each variable name is associated with a specific _____in the computer memory.

4. (2 pts) FORTRAN is a _____oriented language.

5. (2 pts) A memory register that can hold only one character is called _____. Otherwise is called a _____.

6. (1 pt) A memory register is identified by its

   a. contents
   b. name
   c. address
   d. identifier
   e. none of the above

7. (1 pt) In FORTRAN a variable name cannot be more than _____characters long.

8. (2 pts) A variable can be defined by an _____statement or by an _____statement.

9. (5 pts) Each of the following is considered to define a variable in FORTRAN. Indicate the mode if the variable is valid. If the variable is not valid explain why.

   a. weight

   b. W E I G H T

   c. 6THCOL

   d. INCOME

   e. AVERAGE1

Name_____

Gortan Resinovic
1st Summer Session 1982

K201 Quiz 1A

1. (3 pts) The components of CPU are

   a. _____

   b. _____

   c. _____

_____ 2. (1 pt) The number that identifies a memory register is called

   a. identifier
   b. contents
   c. address
   d. name
   e. none of the above

_____ 3. (2 pt) An IBM card has

   a. 10 rows and 72 columns
   b. 12 rows and 72 columns
   c. 10 rows and 80 columns
   d. 12 rows and 80 columns
   e. none of the above

4. (2 pt) When a program is translated into machine language, each variable name is associated with a specific _____ in the computer memory.

5. (4 pts) Each of the following are considered to be a FORTRAN variable. Indicate the mode if the variable is valid, if the variable is not valid explain why.

   a. idno
   b. T 25 MN
   c. GRSINCM
   d. 6THNØ

6. (4 pts) Translate into FORTRAN notation each of the following expressions:

   a) $4\sqrt{X} - \frac{5}{Y} + \frac{1}{2}Z$ _____

   b) $(P-3C)^{3+M} - \frac{B^{2I}+D}{D^2-X}$ _____

7. (2 pts) In FORTRAN the result of a division with integers is always an (which mode) _____ number obtained by _____.

G. Resinovic

Name_____

K201-Quiz 4D
11/4/81

(10 pts) 1. We have 400 cards punched with the following layout:

card columns	Description
1-7	Item Number (Integer)
8-12	Quantity on Hand (XXXXX$_{\wedge}$)
13-17	Quantity on Order (XXXXX$_{\wedge}$)

At the beginning of a program we wish to read the cards and establish three arrays: the array INØ of item numbers, the array QØH of quantity on hand, and the array QØØ of quantity on order. On the coding form below write the FORTRAN statements required for this portion of a program.

G. Resinovic

Name _____

Section _____

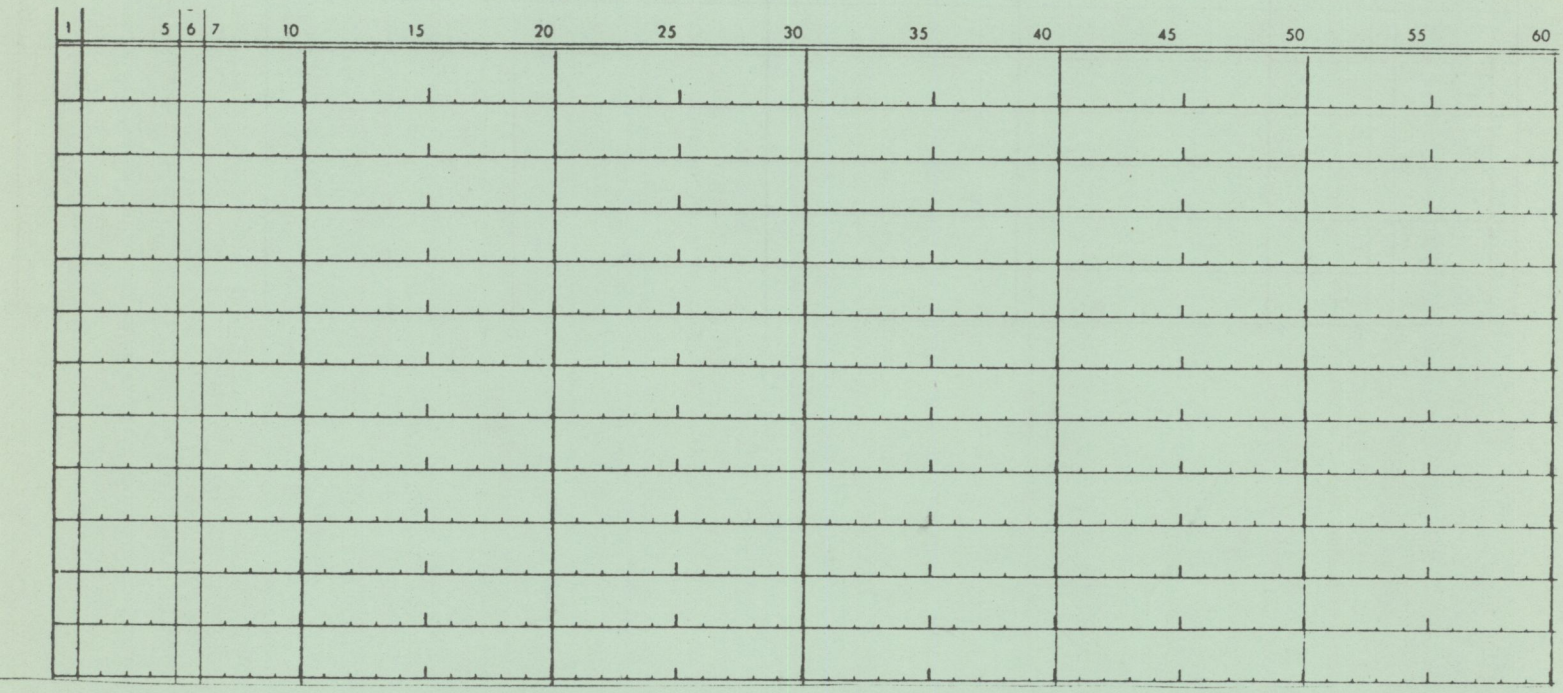
K201 - Quiz 4A

(10 pts) 1. A particular product is composed of 800 parts. The manufacturer has two warehouses for the spare parts of this product, west warehouse (WW) and east warehouse (EW).

A card is punched for each item (spare part) with the following card layout:

Card Column	Description	Variable Name
1-6	Item #	INØ
20-23	Quantity on hand in WW	WW
24-27	Quantity on hand in EW	EW

Write all the necessary FORTRAN statements to reserve the space in the memory for 3 arrays (INØ, WW, EW) and read the data from the cards into these arrays.



G. Resinovic

Name_____

K201 Quiz 4C
11/4/81

(10 pts) 1. We have 250 cards with the following layout:

card columns	Description
1-5	Employee Number (Integer)
6-8	Regular Hours Worked (XX^X)
9-11	Overtime Hours Worked (XX^X)

At the beginning of a program we wish to read these cards and establish three arrays: the array MPL of employee numbers, the array RH of regular hours worked, and the array ØTH of overtime hours worked. On the coding form below write the FORTRAN statements required for this portion of a program.

Name_____

Gortan Resinovic
1st Summer Session 1982

K201 Quiz 1A

1. (3 pts) The components of CPU are

   a. _____

   b. _____

   c. _____

_____ 2. (1 pt) The number that identifies a memory register is called

   a. identifier
   b. contents
   c. address
   d. name
   e. none of the above

_____ 3. (2 pt) An IBM card has

   a. 10 rows and 72 columns
   b. 12 rows and 72 columns
   c. 10 rows and 80 columns
   d. 12 rows and 80 columns
   e. none of the above

4. (2 pt) When a program is translated into machine language, each variable name is associated with a specific _____ in the computer memory.

5. (4 pts) Each of the following are considered to be a FORTRAN variable. Indicate the mode if the variable is valid, if the variable is not valid explain why.

   a. idno
   b. T 25 MN
   c. GRSINCM
   d. 6THNØ

6. (4 pts) Translate into FORTRAN notation each of the following expressions:

   a) $4\sqrt{X} - \frac{5}{Y} + \frac{1}{2}Z$ _____

   b) $(P-3C)^{3+M} - \frac{B^{2I+D}}{D^2-X}$ _____

7. (2 pts) In FORTRAN the result of a division with integers is always an (which mode) _____ number obtained by _____.

G. Resinovic

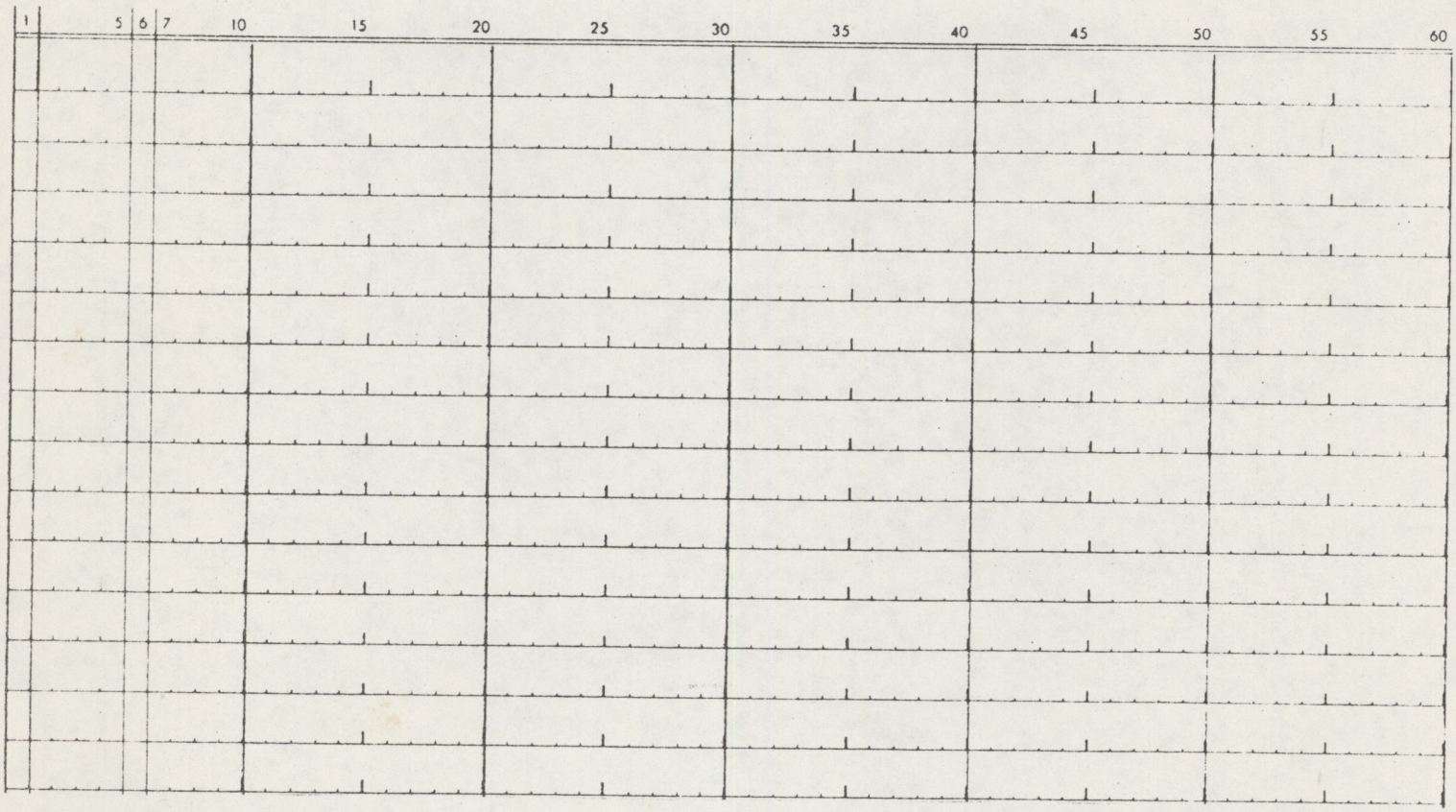
Name_____
Section #_____

K201 - Quiz 6

1. You are given a set of cards with the following card layout:

Columns	Variable	Form
1-9	IDS	
12-17	NUM	
22-25	PTI	XX^XX
26-33	QTI	XXXXXX^XX
34-35	Y	XX^

Cards are sorted according to control variable NUM. The end-of-data card has a negative number in the field IDS. Prepare a complete FORTRAN program to read these cards and copy them on magnetic tape with no space between the fields on the tape. Be sure to terminate this program properly.



G. Resinovic

Name KEY
Section

K201 - Quiz 6A

(9 pts) 1. Consider a program which copies a file from the tape 31 (old file) to the tape 16 (new file). Write a FORTRAN statement that will check the end-of-file condition and send control to statement #77 when this condition occurs. Also, write all the necessary statements in termination part of the program (starting with statement #77).

```
      IF(EOF(31).EQ.1)GO TO 77
77    ENDFILE 16
      REWIND 16
      REWIND 31
      STOP
      END
```

1 point each

½ points each

-1 pt if out of order

G. Resinovic

Name _____
Section _____

K201 - Quiz 4A

(10 pts) 1. A particular product is composed of 800 parts. The manufacturer has two warehouses for the spare parts of this product, west warehouse (WW) and east warehouse (EW).

A card is punched for each item (spare part) with the following card layout:

Card Column	Description	Variable Name
1-6	Item #	INØ
20-23	Quantity on hand in WW	WW
24-27	Quantity on hand in EW	EW

Write all the necessary FORTRAN statements to reserve the space in the memory for 3 arrays (INØ, WW, EW) and read the data from the cards into these arrays.

```
      DIMENSIØN INØ(800),WW(800),EW(800),TØT(800)
      DØ40 M=1,800
40    READ(5,1)INØ(M),WW(M),EW(M)
1     FØRMAT(I6,16X,2F4.0)
```

G. Resinovic

Name_____
Section #_____

K201 - Quiz 6

1. You are given a set of cards with the following card layout:

Columns	Variable	Form
1-9	IDS	
12-17	NUM	
22-25	PTI	XX^XX
26-33	QTI	XXXXXX^XX
34-35	Y	XX^

Cards are sorted according to control variable NUM. The end-of-data card has a negative number in the field IDS. Prepare a complete FORTRAN program to read these cards and copy them on magnetic tape with no space between the fields on the tape. Be sure to terminate this program properly.

```
   10 READ(5,1)IDS,NUM,PTI,QTI,Y
    1 FORMAT(I9,2X,I6,4X,F4.2,F8.2,F2.0)
      IF(IDS.LT.0)GOTO100
      WRITE(11,2)IDS,NUM,PTI,QTI,Y
    2 FORMAT(I9,I6,F4.2,F8.2,F2.0)
      GOTO10
  100 ENDFILE 11
      REWIND 11
      STOP
      END
```

G. Resinovic

Name_____

K201 Quiz 4
11/4/81 F

(10 pts) 1. We have 250 cards with the following layout:

card columns	Description
1-5	Employee Number (Integer)
6-8	Regular Hours Worked (XX^X)
9-11	Overtime Hours Worked (XX^X)

At the beginning of a program we wish to read these cards and establish three arrays: the array MPL of employee numbers, the array RH of regular hours worked, and the array ØTH of overtime hours worked. On the coding form below write the FORTRAN statements required for this portion of a program.

```
      DIMENSION INO(330),Q(330),UWT(330)
      DO 5 I=1,330
5     READ(5,2),INO(I),Q(I),UWT(I)
2     FORMAT(I6,F4.0,F3.1)
```

G. Resinovic

Name _____

Section _____

K201 - Quiz 4B

(10 pts) 1. There are 1350 different items in a particular warehouse. For each item a card is punched with the following card layout:

Card Column	Description	Variable Name
1-6	Item #	N
16-19	Quantity on hand	QØH
20-24	Price (XXX$\wedge$XX)	PR

Write all the necessary statements to reserve the space in the memory for 3 arrays (N, QØH, PR) and read the data from the cards into these arrays.

```
      DIMENSIØN N(1350),QØH(1350),PR(1350)
      DØ 20 K=1,1350
   20 READ(5,1) N(K),QØH(K),PR(K)
    1 FØRMAT(I6,9X,F4.0,F6.2)
```

G. Resinovic

Name_____

K201 Quiz 4C B
11/4/81

(10 pts) 1. We have 250 cards with the following layout:

card columns	Description
1-5	Employee Number (Integer)
6-8	Regular Hours Worked (XX^X)
9-11	Overtime Hours Worked (XX^X)

At the beginning of a program we wish to read these cards and establish three arrays: the array MPL of employee numbers, the array RH of regular hours worked, and the array ØTH of overtime hours worked. On the coding form below write the FORTRAN statements required for this portion of a program.

```
      DIMENSIØN NSS(500),R(500),HRS(500)
      DØ 5 I=1,500
    5 READ(5,2)NSS(I),R(I),HRS(I)
    2 FØRMAT(I9,F4.2,F3.1)
```

G. Resinovic

Name_____

K201-Quiz 4D
11/4/81

(10 pts) 1. We have 400 cards punched with the following layout:

card columns	Description
1-7	Item Number (Integer)
8-12	Quantity on Hand (XXXXX$_\wedge$)
13-17	Quantity on Order (XXXXX$_\wedge$)

At the beginning of a program we wish to read the cards and establish three arrays: the array INØ of item numbers, the array QØH of quantity on hand, and the array QØØ of quantity on order. On the coding form below write the FORTRAN statements required for this portion of a program.

```
      DIMENSIØN MPL(250),RH(250),ØTH(250)
      DØ 5 I=1,250
    5 READ(5,2),MPL(I),RH(I),ØTH(I)
    2 FØRMAT(I5,,2F3.1)
```

G. Resinovic

Name _____

K201-Quiz 4
11/4/81

E

(10 pts) 1. We have 400 cards punched with the following layout:

card columns	Description
1-7	Item Number (Integer)
8-12	Quantity on Hand (XXXXX^)
13-17	Quantity on Order (XXXXX^)

At the beginning of a program we wish to read the cards and establish three arrays: the array INØ of item numbers, the array QØH of quantity on hand, and the array QØØ of quantity on order. On the coding form below write the FORTRAN statements required for this portion of a program.

```
      DIMENSIØN NUM(75),T1(75),T2(75)
      DØ 5 I=1,75
    5 READ(5,2),NUM(I),T1(I),T2(I)
    2 FØRMAT(I9,2F3.0)
```

G. Resinovic

Name _____

K201 Quiz 4
11/4/81 A

(10 pts) 1. We have 250 cards with the following layout:

card columns	Description
1-5	Employee Number (Integer)
6-8	Regular Hours Worked (XX^X)
9-11	Overtime Hours Worked (XX^X)

At the beginning of a program we wish to read these cards and establish three arrays: the array MPL of employee numbers, the array RH of regular hours worked, and the array ØTH of overtime hours worked. On the coding form below write the FORTRAN statements required for this portion of a program.

```
      DIMENSIØN MPL(250),RH(250),ØTH(250)
      DØ 5 I=1,250
    5 READ(5,2)MPL(I),RH(I),ØTH(I)
    2 FØRMAT(I5,F3.1,F3.1) or (I5,2F3.1)
```

optional

```
      DIMENSIØN INØ(200),P(200),Q(200)[,AMT(200)]
      DØ 5 I=1,200
    5 READ(5,2)INØ(I),P(I),Q(I)
    2 FØRMAT(I8,F5.2,F3.0)
```

G. Resinovic

K502
Computer Tools
Summer, 1982, IUPUI

Class Meets: 9:30-12:30 Saturdays, BS1000

Office Hours: By Appointment

Telephone: 335-8449, Bloomington

Required Test: Martin, E.W. and Perkins, W.C., FORTRAN for Business Students: A Programmed Instruction Approach, John Wiley and Sons, Inc. 1981.

Course Objective: This course is designed to provide the background that a manager should have in order to understand computers and their use in business. It also covers enough of the basics of FORTRAN programming to enable the student to write simple programs.

Teaching Method: This course is based upon a set of programmed materials which you must work through before the class meets for which they are assigned. You are asked to study the summary and work the problems at the end of each section. Any questions on the material will be answered in class. The lectures will not cover the text materials, but will instead cover the questions that arise because of the problems in each chapter. Thus, you must do the assignment before the class if the class is to be helpful to you.

Grading:

Labs I-IV (5 pts each)	60 points
Test	100 points
Final Exam	140 points
	300 points

G. Resinovic

Name _____
Section # _____

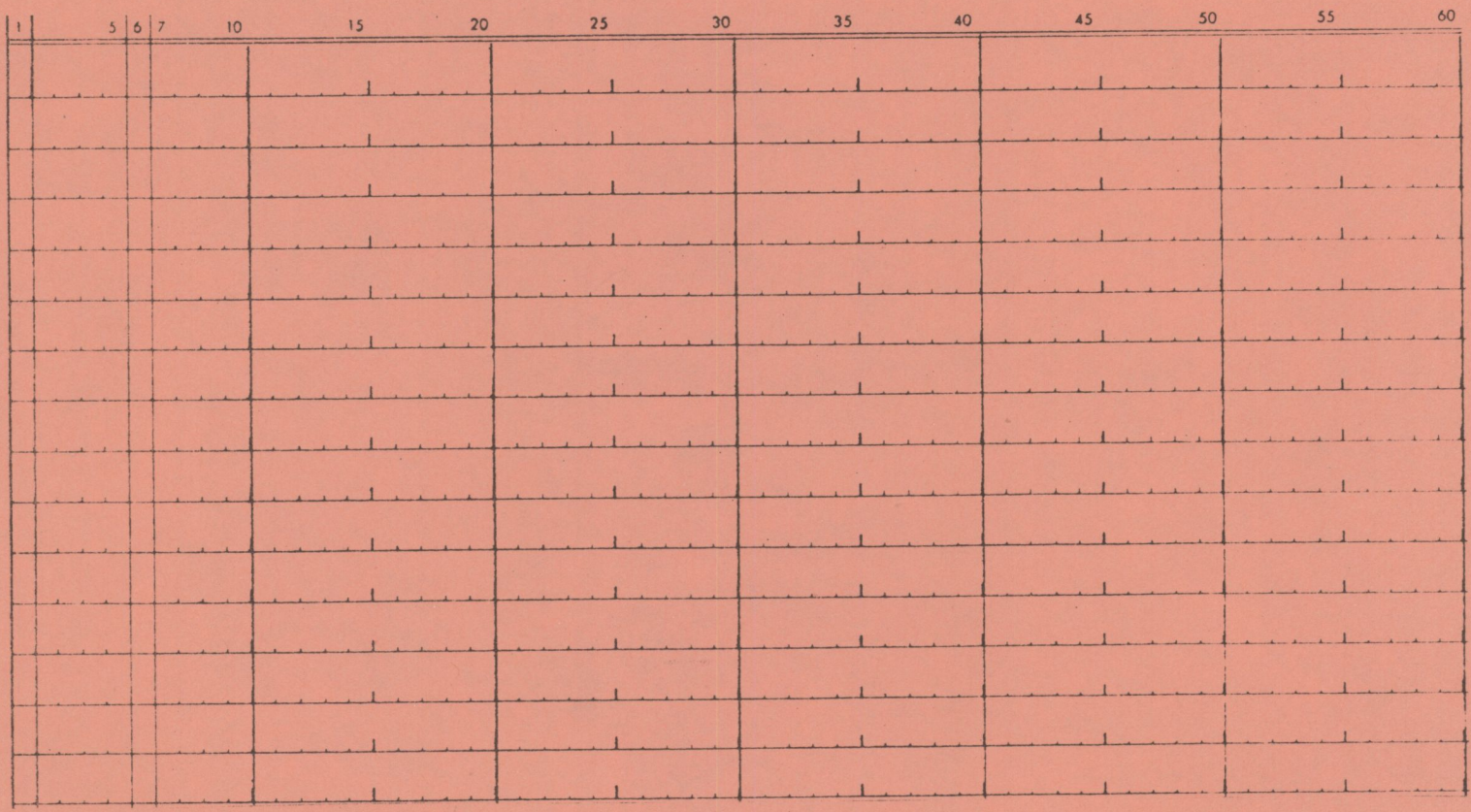
K201 - Quiz 6

1. Consider a deck of cards with the following card layout:

Columns	Variable	Form
1-6	KØDE	
10-14	MAP	
31-36	ART11	X^XXXXX
41-44	ART21	XX^XX
50	INT	

Cards are sorted according to control variable MAP. The end-of-data card has a negative number in the field KØDE.

Prepare a complete FORTRAN program to read these cards and copy them on magnetic tape with no space between the fields on the tape. Be sure to terminate this program properly.



G. Resinovic

Name_____

K201 Quiz 4C
11/4/81

(10 pts) 1. We have 250 cards with the following layout:

card columns	Description
1-5	Employee Number (Integer)
6-8	Regular Hours Worked (XX^X)
9-11	Overtime Hours Worked (XX^X)

At the beginning of a program we wish to read these cards and establish three arrays: the array MPL of employee numbers, the array RH of regular hours worked, and the array ØTH of overtime hours worked. On the coding form below write the FORTRAN statements required for this portion of a program.

G. Resinovic

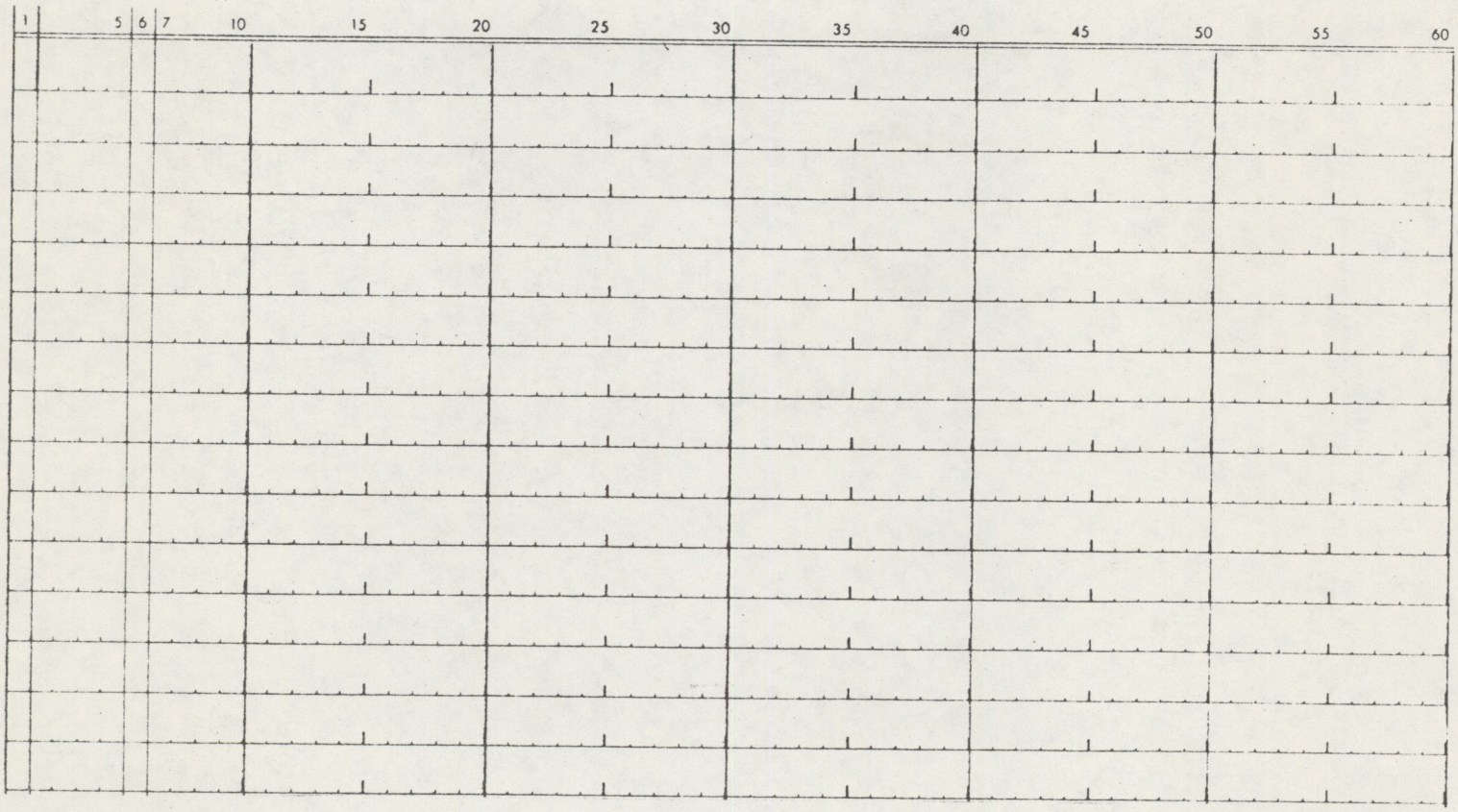
Name_____
Section #_____

K201 - Quiz 6

1. You are given a set of cards with the following card layout:

Columns	Variable	Form
1-9	IDS	
12-17	NUM	
22-25	PTI	XX^XX
26-33	QTI	XXXXXX^XX
34-35	Y	XX^

Cards are sorted according to control variable NUM. The end-of-data card has a negative number in the field IDS. Prepare a complete FORTRAN program to read these cards and copy them on magnetic tape with no space between the fields on the tape. Be sure to terminate this program properly.



Name_____

K201-Quiz 3A

(3 pts) _____1. Let N be the two dimentional array $\begin{pmatrix} 7,6,3 \\ 2,8,5 \end{pmatrix}$. If JCSØGS=N(1,1)+N(2,2)*N(2,1), what is the value of JCSØGS.

a. 23
b. 53
c. 30
d. 11
e. none of the above

(2 pts) 2. The operating system is told how to process a job by means of a _____ _____language.

(4 pts) 3. Communication interface software is a part of support software. List two other groups of groups which we consider as a part of support software.

_____ _____

(2 pts) 4. Programmers who produce and maintain the user programs are called the _____programmers.

(4 pts) 5. Finish card is the last parameter card for a BMD1D program. Name two other parameter cards necessary to run this program.

_____ _____

Name_____

K201-Quiz 3B

(2 pts) 1. The language we use to prepare our control cards is called a _____ _____language.

(4 pts) 2. Translators are a part of support software. List two other groups of programs which we consider as a part of support software.

_____ _____

(2 pts) 3. Programmers who produce and maintain the support software are called the _____PROGRAMMERS.

(4 pts) 4. There are five parameter cards necessary to run BMD5D program. Name two of them.

_____ _____

(3 pts) _____5. Let N be the two dimensional array $\begin{pmatrix}7,6,3\\2,8,5\end{pmatrix}$. If

JCSØGS=N(1,1)+N(2,2)*N(2,1), what is the value of JCSØGS ?

a. 23
b. 53
c. 30
d. 11
e. none of the above

K201
Quiz # 5 Name_____

Consider the following FORTRAN program:

```
      DIMENSION ALT(5), SNAKES(5)
      OPEN (UNIT=5, FILE='INPUT.DAT',STATUS='OLD')
      OPEN (UNIT=6, FILE='PRINT.DAT',STATUS='NEW')
      DO 10 K = 1,5
 10   READ (5, 100) ALT(K), SNAKES(K)
100   FORMAT (F4.0, 1X, F2.0)
 20   READ (5, 200) HT
      IF (HT .LT. 0) STOP
      IF (HT .LT. 3000) GOTO 70
      DO 30 K = 1,5
      IF (HT .LE. ALT(K)) GOTO 50
 30   CONTINUE
      WRITE (6, 200)
200   FORMAT ('0', 'NO SNAKES ABOVE 9000 FEET')
      GO TO 20
 50   WRITE (6, 300) SNAKES (K), HT
300   FORMAT ('0', F3.0,2X,'SNAKES/ACRE AT',2X,F5.0,2X,'FEET')
      GOTO 20
 70   WRITE (6, 400)
400   FORMAT ('0','MANY SNAKES/ACRE BELOW 3000 FEET')
      GOTO 20
      END
```

If this program were run, and the file INPUT.DAT contained the following records, specify exactly what would be written into the file named PRINT.DAT.
(Note: each line below represents one input record, starting in column 1, and the symbol b stands for a blank space.)

```
4000b98
6000b85
7000b42
8000b21
9000b07
3400
9800
1600
7200
b5400
-99
```

Write below exactly what PRINT.DAT would contain after this program runs.

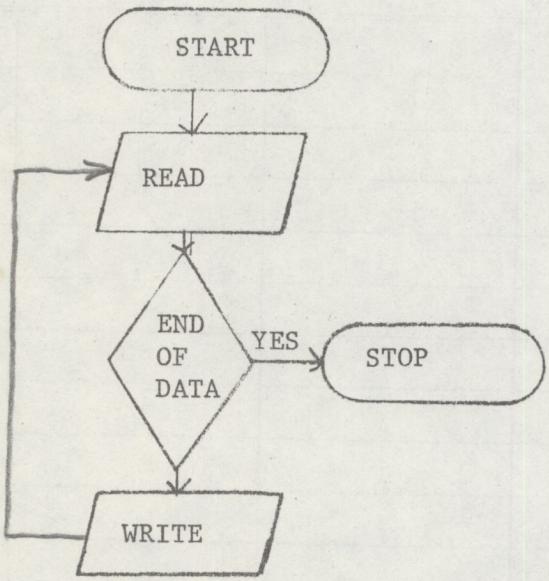
Name_____ K201 Quiz 2 (B) May 27, 1982

(3 pts) _____1. Run time error messages that partially explain why execution was terminated appear
a. at the very end of the printout after the FORTRAN program.
b. after each line of the FORTRAN program containing an error
c. in the area where the control cards are listed before the printout of the FORTRAN program
d. one of the above depending from computer to computer
e. none of the above

(3 pts) _____2. Which of the following is true:
a. test data cards are used to detect syntax errors only
b. test data cards are used to detect logical erros only
c. test data cards are used to detect both syntax and logical errrors
d. none of the above

(3 pts) 3. The method of using parameters instead of constants in order to make a program more flexible is called program _____.

(3 pts) _____4. The flowchart below corresponds to
a. a condition controlled loop
b. a count-controlled loop
c. an uncontrolled loop
d. none of the above



(4 pts) _____5. You are given the following set of statements:

```
      M=8
      DO 7 I=4,M
    7 K=I+M
```

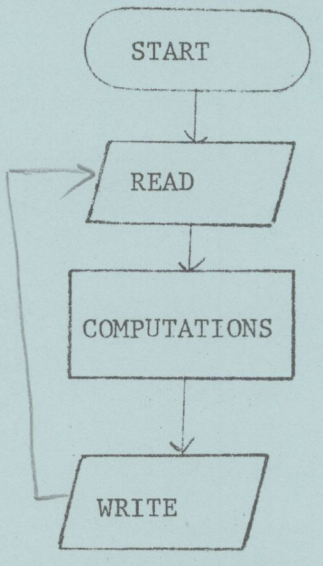
How many times will statement #7 be executed?
a. 5
b. 4
c. 1
d. none of the above

Name_____ Quiz 2 (A) May 27, 1982

(3 pts) _____1. Syntax errors in a FORTRAN program are detected
a. at compilation time
b. by writing WRITE/FORMAT debugging statements
c. at the execution time
d. none of the above

(3 pts) _____2. The test data cards are prepared by:
a. the computer operator
b. user
c. programmer
d. none of the above

(3 pts) _____3. The following part of a flowchart represents
a. a condition-controlled loop
b. a count-controlled loop
c. an uncontrolled loop
d. none of the above



(4 pts) _____4. You are given the following set of statements:

```
      K=0
      DO5 I=3,6
    5 K=K+I
```

How many times will statement #5 be executed?

a. 5
b. 4
c. 1
d. none of the above

(2 pts) 5. Changing or modifying programs from time to time to keep them up to date is called _____.

(3 pts) 6. The execution of a program is terminated and the capital letter I is printed instead of a numeric result if _____was attempted.

E. W. Martin

K201 Exam
12/9/74

(30 pts.) 1. Identify any errors in the following FØRTRAN statements

a) X2 = (RATE(3) - RATE(-3))/D

b) DO 40 I=0,17

c) X3 = S*T(2.) + 16.

d) DO 40 Y=1,24,3

e) X4 = A(N)/B(3*N-2)

f) X5 = TIME(2*K/L)

(20 pts.) 2. What would be the value of M after executing each of the following program segments?

a)
```
M=0
DO 13 I=1,20
13 M=M+1
```
M=_____

b)
```
M=0
DO 13 I=1,12,2
13 M=M+1
```
M=_____

c)
```
DO 13 J=1,5
DO 13 I=1,7
13 M=M+1
```
M=_____

d)
```
DO 15 I=1,6
DO 20 J=1,5
15 M=M+1
20 M=M-1
```
M=_____

3. Assume that we have an array W composed of 300 elements already stored in the computer memory (i.e., defined and already dimensioned) as a result of a previous portion of the program. Write a program segment (including any needed DIMENSION statements) for each of the following independent purposes:

(10 pts.) a) Add together the squares of all the elements of W and call the results WSQ.

(25) 4. a) Write a subprogram that accepts an array X with K elements ($K \leq 50$) and calculates the sum XSUM of the elements and the sum XSUM2 of the squares of the elements of X and returns XSUM and XSUM2 to the calling program.

(15) b) Consider a program in which we have defined an array A with 50 elements and an array B with 40 elements. Use the above subprogram to calculate the ratio R1 that equals the sum of the squares of the A's divided by the sum of the squares of the B's and the ratio R2 that equals the sum of the A's divided by the sum of the B's. You do not need to write a complete program here--only the statements required to compute R1 and R2.

1. Define or explain each of the following:

   a) a sequential access file
   b) interactive use of a computer
   c) multiprogramming
   d) a terminal
   e) an index to a file
   f) file organization
   g) an inverted file

2. In a program called XK201, show all the statements required to read a record from tape number 10 whose record layout is as follows:

Position	Variable Name	Form
1-9	NSS	integer
10-37	N1,N2,N3,N4,N5,N6,N7	alphabetic
38-39	NEXMPT	integer
40-45	SALARY	XXXX$_{\wedge}$XX
46-50	DEDS	XXX$_{\wedge}$XX
51-57	YTDPAY	XXXXX$_{\wedge}$XX

3. Suppose a bank has a file containing data on the status of each customer's checking account, organized by social security number. Each day they need to print out this record for a number of customers, given the required social security number.

   a) If this file is on magnetic tape, devise a procedure that will result in printing the desired checking account records.

   b) Prepare an overall flow chart for the computer program that causes these records to be printed.

   c) Suppose this customer checking account file is a direct access file rathern than a tape file. Modify the procedure in part a) to use the direct access file to print these records.

   d) Prepare an overall flow chart for the computer program that causes these records to be printed from the direct access file.

(10 pts.) b) Add together the even-numbered elements of W and call the result WEVEN.

(15 pts.) c) Find the smallest non-negative element of W and call it WSM.

(15 pts.) d) Produce an array X such that each element of X is 1 divided by the corresponding element of W, unless the element of W is 0, in which case the resulting element of X should be -9999.

7. Compute the following

(4 pts) a)

```
      X=1.
      M=2
      DO 10 I=2,5
   10 X=X**M+2.*X
```

M = _____

X= _____

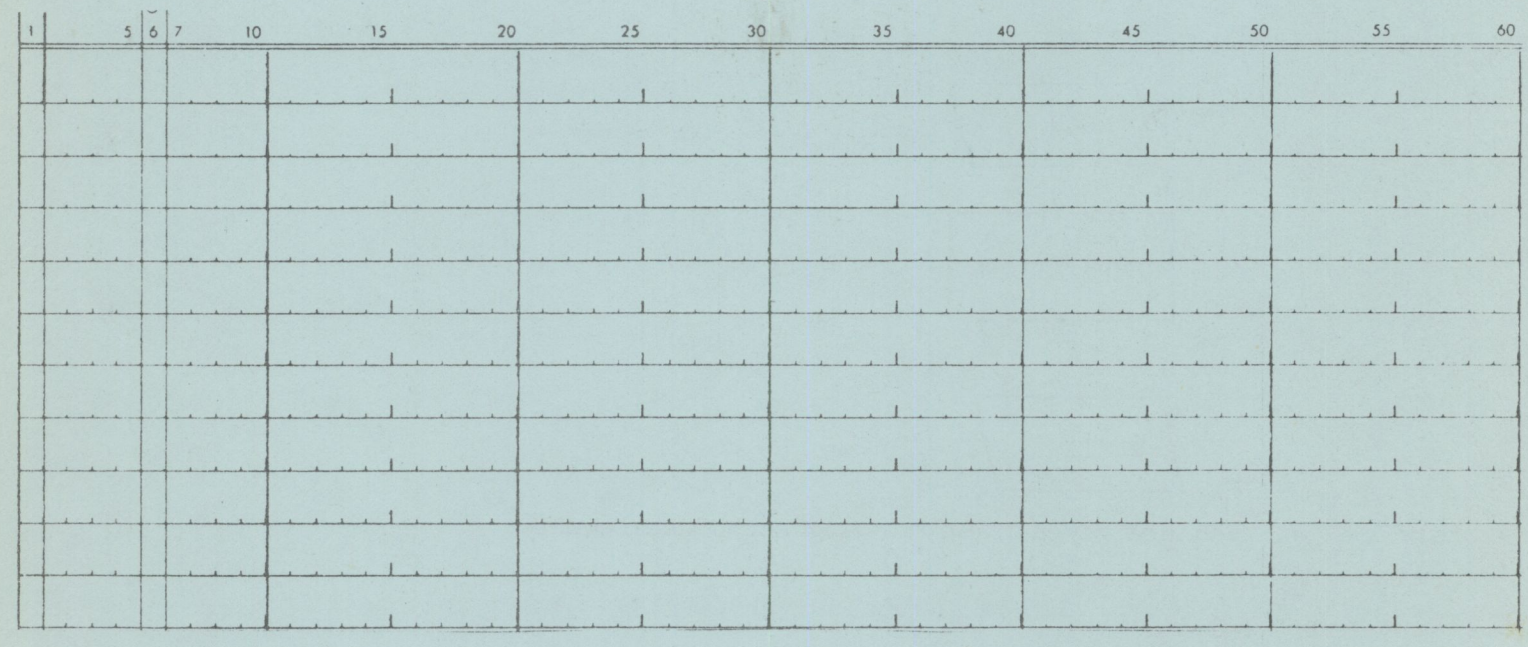
(4 pts) b)

```
      NSUM=1
      N=1
      M=1
      J=5
      DO 8 I=M,J
      N=N+1
    8 NSUM=NSUM+N**2
```

N= _____

NSUM= _____

(4 pts) 8. Write the statement (using DO loop) necessary to read variables INO,QTY,P from a card. Compute AM=QTY*P, and print a line showing INO & AM. There are 56 data cards in a deck. You don't need to write FORMAT statement.



(2 pts) 6. The repeated execution of a sequence of statements in a program is called _____.

7. Compute the following

(4 pts) a)
```
      X=-1.
      N=3
      DO 729 J=4, 6
  729 X=X**N+X
```
N=_____

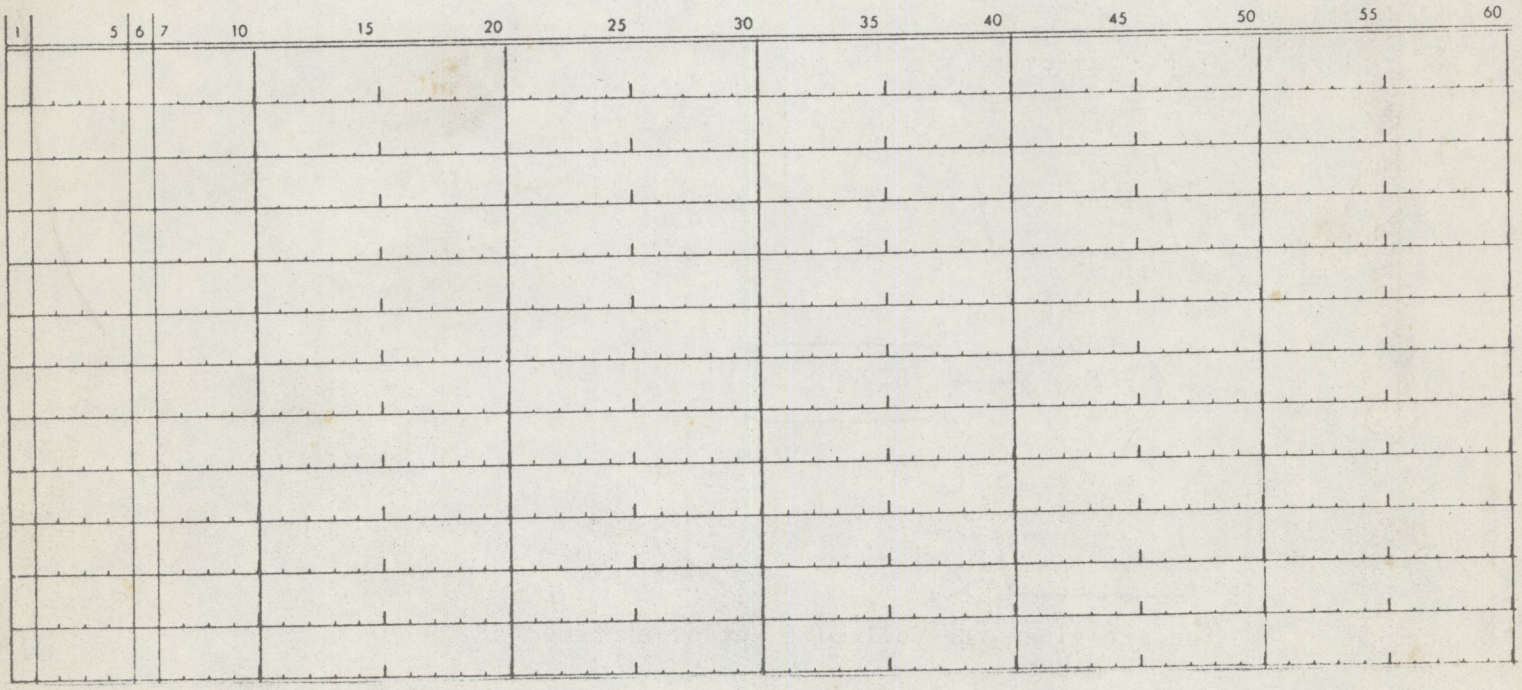
X=_____

N=1
K=0

(4 pts) b)
```
      M=3
      J=8
      DO 7 I=M,J
      K=K+I
    7 N=N+J+K
```
N=_____

K=_____

(4 pts) 8. Write the statements (using DO loop) necessary to read variables NSS,CP,CH from a card, compute GPA=CP/CH, and print a line showing NSS & GPA. There are 48 data cards in a deck. You don't need to write FORMAT statements.



(15 pts) 6. Consider the following sales cards:

Card Columns	Description
1-6	Data (month-day-year)
7-11	Customer number (1800 active customers)
12-13	Number of the office that made the sale (there are 42 offices)
14-16	Number identifying the salesman who made the sale (there are 137 salesmen)
17-21	Item number (5000 items)
42-45	Quantity sold
46-51	Dollar amount of sale (XXXX XX)

We wish to produce the following reports summarizing dollar sales from these cards.

Sales by Salesman

Sales by Customer

Prepare a system flow chart to produce these reports using sorting to organize the data. Be sure to use standard symbols and conventions in the flow charts in this question. You may assume that the sales cards have been punched and are available in off-line storage.

(15 pts) 6. We are interested in analyzing voter turn-out in the election in Indiana. In particular, we would like to produce the following two reports:

VOTING BY COUNTRY

VOTING BY AGE

A card has been prepared for each individual who voted in the primary election. Each card contains the following information:

Card Columns	
1-30	Name of voter
31	Party code (1-democart, 2=republican)
32-33	Age of voter (ranges from 18 to 99)
34-35	County number (ranges from 1 to 92)

Prepare a system flow chart using standard symbols and conventions for preparing the above reports using sorting to organize the data. You may assume that the cards have been punched and are available in offline storage.

2. You are given a set of documents rather than cards. On each document the same data are recorded as in question 1.

   Design a system flow chart to make a new file on magnetic tape from these data. The control key for a new file is IDS.

(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array THW of the total hours worked by each employee, each element of which is the regular hours worked (from array RH) plus the overtime hours worked (from array ØTH). Write the FORTRAN statements required to create the array THW, and also to count the number of employees who worked overtime (overtime hours greater than zero) and call this count C.

2. You are given a set of documents rather than cards. On each document the same data are recorded as in question 1.

   Prepare a system flowchart to update the file on magnetic tape with these data.

Assignment Schedule

Date	Text	Other
May 15	Introduction Chapter 1	Ex. 5, Section 1.3
May 22	Chapter 2 Chapter 3	Lab 1 assigned Ex. 5 due
May 29	Chapter 4 Chapter 5	Lab II assigned Lab I due
June 5	Chapter 6 Test	Lab III assigned Lab II due
June 12	Chapter 7 Chapter 8 Chapter 9	Lab IV assigned Lab III due
June 19	Chapter 10 FINAL EXAM	Lab IV due

(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array THW of the total hours worked by each employee, each element of which is the regular hours worked (from array RH) plus the overtime hours worked (from array ØTH). Write the FORTRAN statements required to create the array THW, and also to count the number of employees who worked overtime (overtime hours greater than zero) and call this count C.

```
      (DIMENSION AMT(200)) optional
      TAMT=0
      DO 15 I=1,200
      AMT(I)=P(I)*Q(I)
   15 TAMT=TAMT+AMT(I)
```

(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array Q of the total of the quantity on hand (from array QØH) and the quantity on order (from array QØØ). On the coding form below write the FORTRAN statements required to create the array Q, and also to count the number of items that have nothing on order (QØØ equal to zero) and call this count K.

```
      DIMENSIØN TTS(75)
      NAS=0
      DØ 15 I=1,75
      TTS(I)=T1(I)+T2(I)
      IF(TTS(I).GT.180.)NAS=NAS+1
   15 CØNTINUE
```

(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array Q of the total of the quantity on hand (from array QØH) and the quantity on order (from array QØØ). On the coding form below write the FORTRAN statements required to create the array Q, and also to count the number of items that have nothing on order (QØØ equal to zero) and call this count K.

```
      DIMENSION THW(250)
      DO 15 I=1,250
      THW(I)=RH(I)+OTH(I)
      IF(OTH.GT.0.)C=C+1
   15 CONTINUE
      C=0
```

(I)

(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array THW of the total hours worked by each employee, each element of which is the regular hours worked (from array RH) plus the overtime hours worked (from array ØTH). Write the FORTRAN statements required to create the array THW, and also to count the number of employees who worked overtime (overtime hours greater than zero) and call this count C.

```
      DIMENSION PAY(500)
      TPAY=0
      DO 15 I=1,500
      PAY(I)=R(I)*HRS(I)
   15 TPAY=TPAY+PAY(I)
```

Quiz 4B (continued)

(10 pts) 2. In the same program we want to calculate the total value of all the items in this warehouse (TV=TV+QØH(I)*PR(I)) and print the item # for each case when QØH(I)=0 (i.e., this item is out of stock).

Write all the necessary FORTRAN statements for this part of the program!

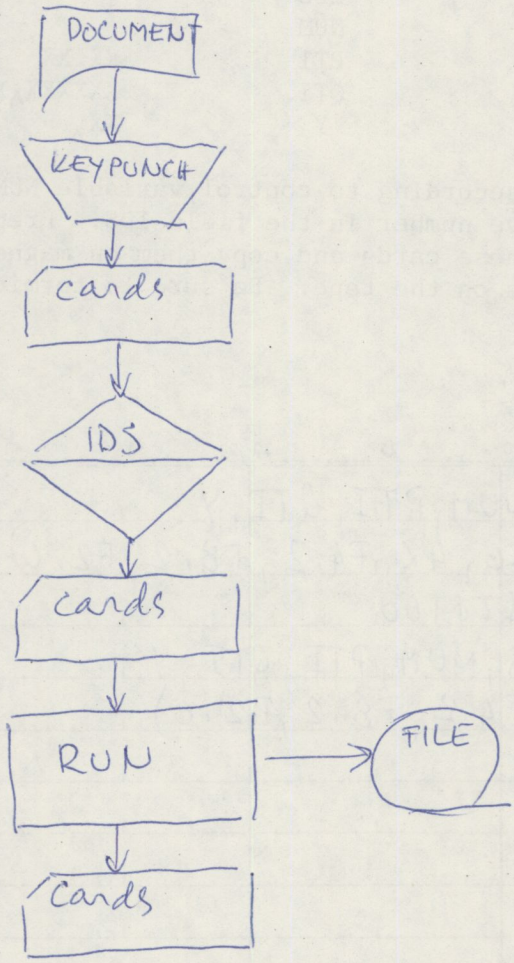
```
      TV=0.
      DØ 30 I=1,1350
      IF(QØH(I).EQ.0.)WRITE(6,2)N(I)
   30 TV=TV+QØH(I)*PR(I)
    2 FØRMAT(' ',I6)
```

(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array THW of the total hours worked by each employee, each element of which is the regular hours worked (from array RH) plus the overtime hours worked (from array ØTH). Write the FORTRAN statements required to create the array THW, and also to count the number of employees who worked overtime (overtime hours greater than zero) and call this count C.

```
      DIMENSIØN THW(330)
      C=0.
      DØ 15 I=1,330
      THW(I)=RH(I)+ØTH(I)
      IF(ØTH(I).GT.0.)C=C+1.
   15 CØNTINUE
```

2. You are given a set of documents rather than cards. On each document the same data are recorded as in question 1.

Design a system flow chart to make a new file on magnetic tape from these data. The control key for a new file is IDS.



(10 pts) 2. In the same program we want to form a new array TØT showing the total quantity on hand in both warehouses for each item (TØT(I)=WW(I)+EW(I)), and print item # (INØ) for each case when TØT(I)=0 (i.e., this part is out of stock in both warehouses). Write all the necessary FORTRAN statements for this part of the program!

```
      DØ30 I=1,800
      TØT(I)=WW(I)+EW(I)
      IF(TØT(I).EQ.0.)WRITE(6,2)INØ(I)
30    CØNTINUE
2     FØRMAT(' ',I6)
```

(11 pts) 2. In a program called UPDATE a report is printed using table look-up on equal and an old file (on tape 23) is updated (on tape 20). Transaction cards are sorted in the same order as the records on the tape. Table values are punched in the table cards.

Design a system flowchart for this problem!

2. You are given a set of documents rather than cards. On each document the same data are recorded as in question 1.

   Design a system flow chart to make a new file on magnetic tape from these data. The control key for a new file is IDS.

8. (2 pts) Let X = 13.95 and I = 7

   a. Let JJ = X Then JJ = _____

   b. Let WEEK = I. Then WEEK = _____

9. (2 pts) Indicate the errors, if any, in the following FORTRAN expressions.

   a. (A-(B+(C-D*(3*E-C)))-5.D)

   b. (I-27)**2-(K/L+1)**3(N-1)

10. (4 pts) Perform the following calculations using FORTRAN rules of arithmetic

   a. (4-5/3)*5/2 = _____

   b. Let A = 2.5 B = 1.5, C = 3.
      C*(A+2.*B)/(A-B) = _____

   c. Let X = 5. L = 2
      X**2/2.+2.5. = _____

   d. Let I = 3, J = 4
      J/I*2 = _____

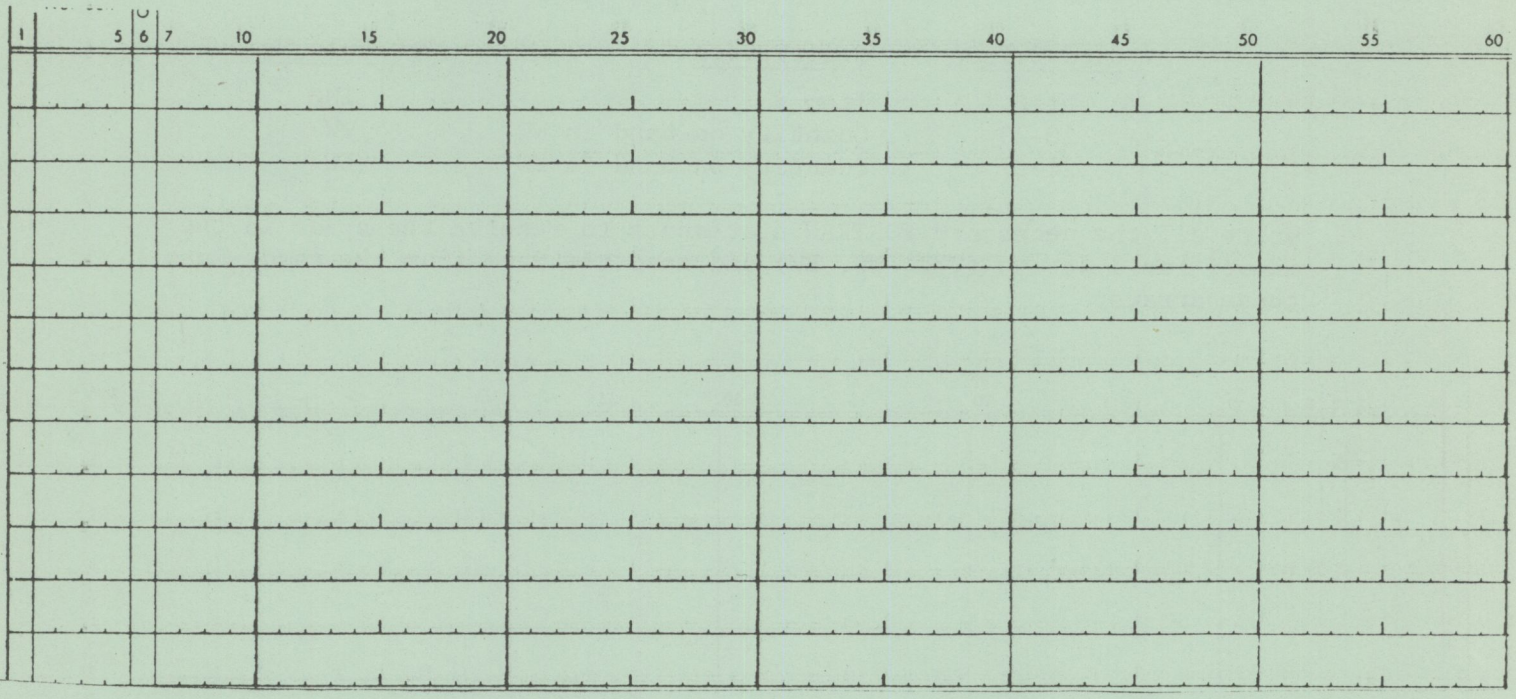
11. (2 pts) A variable can be defined by a(n) _____statement or by an _____statement.

12. (2 pts) A memory register that can hold only one character is called _____. Otherwise is called _____.

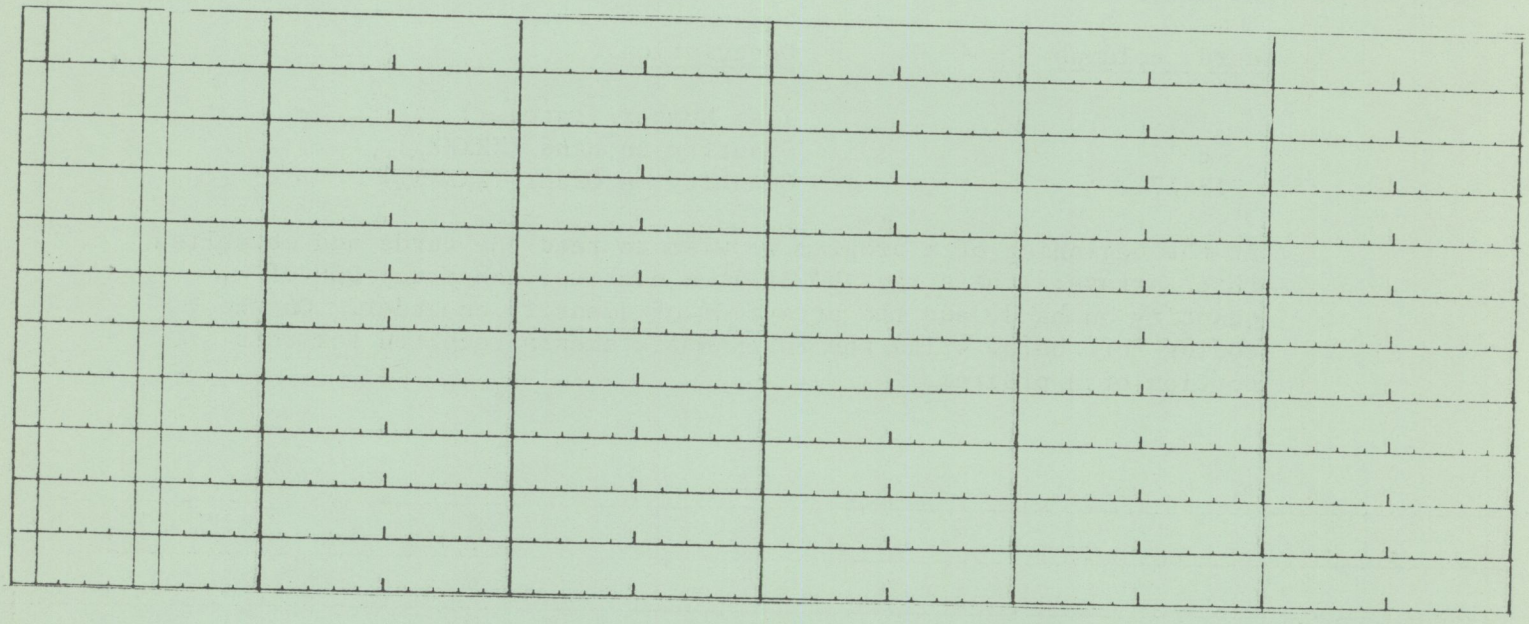
(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array THW of the total hours worked by each employee, each element of which is the regular hours worked (from array RH) plus the overtime hours worked (from array ØTH). Write the FORTRAN statements required to create the array THW, and also to count the number of employees who worked overtime (overtime hours greater than zero) and call this count C.

Quiz 4A (continued)

(10 pts) 2. In the same program we want to form a new array TØT showing the total quantity on hand in both warehouses for each item (TØT(I)=WW(I)+EW(I)), and print item # (INØ) for each case when TØT(I)=0 (i.e., this part is out of stock in both warehouses). Write all the necessary FORTRAN statements for this part of the program!



(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array Q of the total of the quantity on hand (from array QØH) and the quantity on order (from array QØØ). On the coding form below write the FORTRAN statements required to create the array Q, and also to count the number of items that have nothing on order (QØØ equal to zero) and call this count K.



8. (2 pts) Let X = 13.95 and I = 7

   a. Let JJ = X Then JJ = _____

   b. Let WEEK = I. Then WEEK = _____

9. (2 pts) Indicate the errors, if any, in the following FORTRAN expressions.

   a. (A-(B+(C-D*(3*E-C)))-5.D)

   b. (I-27)**2-(K/L+1)**3(N-1)

10. (4 pts) Perform the following calculations using FORTRAN rules of arithmetic

    a. (4-5/3)*5/2 = _____

    b. Let A = 2.5 B = 1.5, C = 3.
       C*(A+2.*B)/(A-B) = _____

    c. Let X = 5. L = 2
       X**2/2.+2.5. = _____

    d. Let I = 3, J = 4
       J/I*2 = _____

11. (2 pts) A variable can be defined by a(n) _____statement or by an _____statement.

12. (2 pts) A memory register that can hold only one character is called _____. Otherwise is called _____.

10. (4 pts) Translate into FORTRAN notation each of the following expressions:

a. $N^2 + 2M + \sqrt{\frac{7}{2}}$ _____

b. $(W + T)^{2N-1} - \frac{X^{I+Y}}{C-X^2}$ _____

11. (2 pts) a. Let X = 13.95 and JJ = X

Then JJ = _____

b. Let I = 7 and WEEK = I

Then WEEK = _____

12. (2 pts) Perform the following calculations using FORTRAN rules of arithmetic:

a. Let A = 2.5 B = 3. C = 1.5

A*(B+2.*C)/(A+C) = _____

b. Let I = 3, J = 4

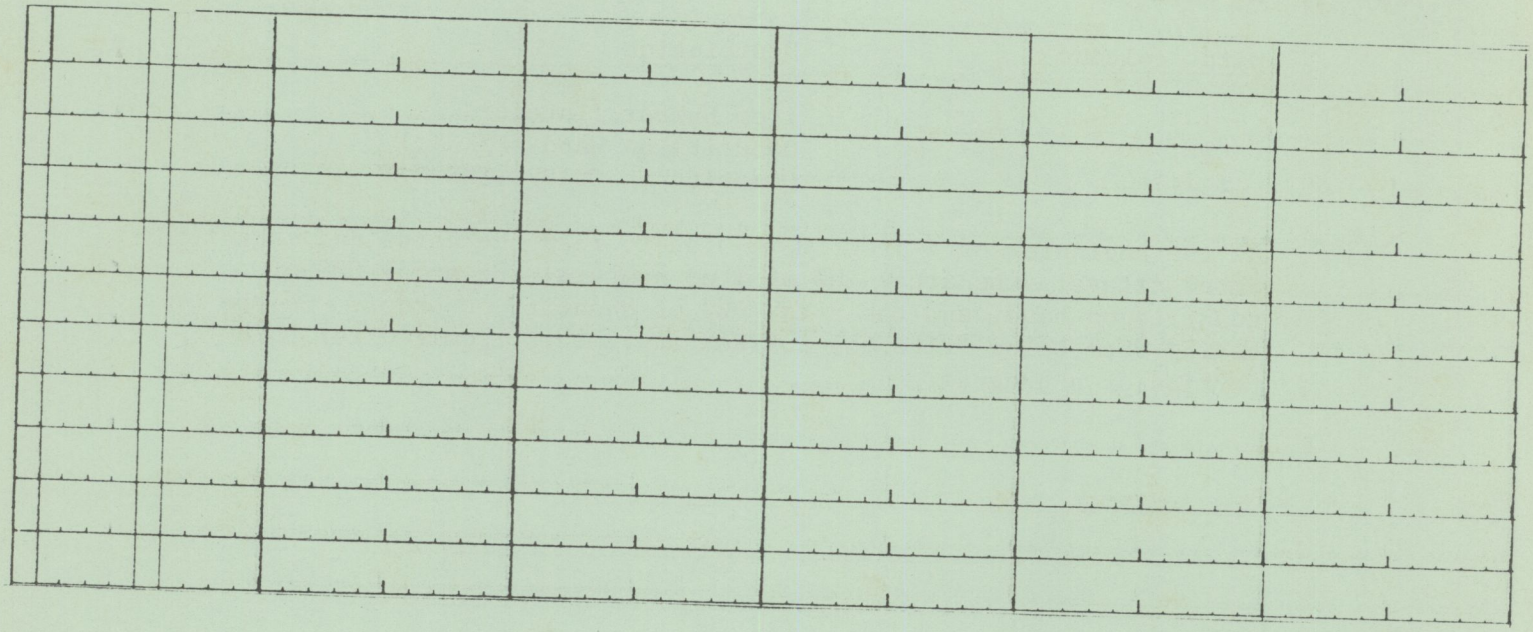
(I+7)/J*2 = _____

13. (2 pts) Indicate the errors, if any, in the following FORTRAN expressions:

a. 2.A - B * 5./(A + B)*C

b. (M + 1)**3 + (2 + K/M) * * (3(N - 1))

(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array Q of the total of the quantity on hand (from array QØH) and the quantity on order (from array QØØ). On the coding form below write the FORTRAN statements required to create the array Q, and also to count the number of items that have nothing on order (QØØ equal to zero) and call this count K.



(10 pts) 2. As a later portion of the program in problem 1, we wish to create an array Q of the total of the quantity on hand (from array QØH) and the quantity on order (from array QØØ). On the coding form below write the FORTRAN statements required to create the array Q, and also to count the number of items that have nothing on order (QØØ equal to zero) and call this count K.

```
      DIMENSIØN Q(400)
      K=0
      DØ 15 I=1,400
      Q(I)=QØH(I)+QØØ(I)
      IF(QØØ(I).EQ.0.)K=K+1
   15 CØNTINUE
```

_____ 12. The key to harnessing the computer's ability to perform repetitive tasks at fantastic speed is

a. the procedure-oriented language
b. the compiler
c. the stored program
d. the high-speed printer
e. none of the above

_____ 13. Which of the following FORTRAN statements is not allowed?

a. Z = I/J
b. AVGE = TOT/3
c. W = P**2
d. I = P+Q + R

Completion Questions (6 questions, 3 points each)

14. Draw the flowchart symbol that represents the beginning or termination of a program.

_____

15. A memory register that can hold one character of data is called a(n)

_____.

16. An arithmetic statement in FORTRAN has the form

_____ = _____

17. A FORTRAN statement that is translated into one or more machine language instruction is called a(n) _____ statement.

18. Statement numbers must be written in columns _____ of the FORTRAN coding form.

19. Indicate how you would punch the number 174.31 in a ten-position decimal field with specification F10.4, assuming that the decimal point is not to be punched. Use the symbol Δ to indicate a blank.

_____

20. After the following sequence of FORTRAN statements, what is the value of D?

```
A = 5.
B = 4.
C = -2.
D = (A*B+C)/B
```

ANSWER _____

Multiple Choice Questions (13 questions, 3 points each)

_____ 1. Which of the following numbers is invalid in FORTRAN?

a. 0
b. +0.02
c. 7,634.63
d. -.0632

_____ 2. In the following expression, what is the mode of the answer when it is placed in the memory register? J = C/D**I

a. integer
b. decimal
c. invalid, mixed mode
d. integer and decimal
e. none of the above

_____ 3. In the translation process each FORTRAN variable name is assigned to a(n)

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

_____ 4. The last statement of a FORTRAN program must be

a. a FINISH statement
b. a PROGRAM statement
c. an END statement
d. a STOP statement

_____ 5. Let I = 2, M = 3 and K = 4 then K/M*I would be evaluated as:

a. 3
b. 2
c. 1
d. 0

4. (9 points) Write an equivalent FØRTRAN expression for each of the following algebraic expressions:

a) $\sqrt{2x^2 + 3}$

b) $\frac{3X + 4Y}{2A}$

c) $(A + 3B)^{1/3}$

5. (25 points) Write a complete FØRTRAN program for the following flow chart.

The input cards have the following layout:

Card Columns	Description	Variable Name
1 - 5	Customer Number	ICN
6 - 25	Name	(Assign your own)
31 - 34	Quantity ordered	QTY

The output report headings at the top of the page should be:

Print Positions	Heading
1 - 8	CUSTOMER
16 - 19	NAME
30 - 37	QUANTITY
41 - 46	AMOUNT

G. Resinovic

Name_____

Section_____

K201-Quiz 2A
9/23/81

(2 pts) 1. Indicate and explain errors(if any) in the following FØRTRAN arithmetic statement:

```
RAD.ØN=(PET-PAUL)**2/((RAD*ØN-1.)*5)-INPUT)
```

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{(27KAPU-U)^2+5.5B}{A+THETA} - R^{2K}$$

(6 pts) 3. Evaluate the following sequence of FØRTRAN statements, given A=3.:

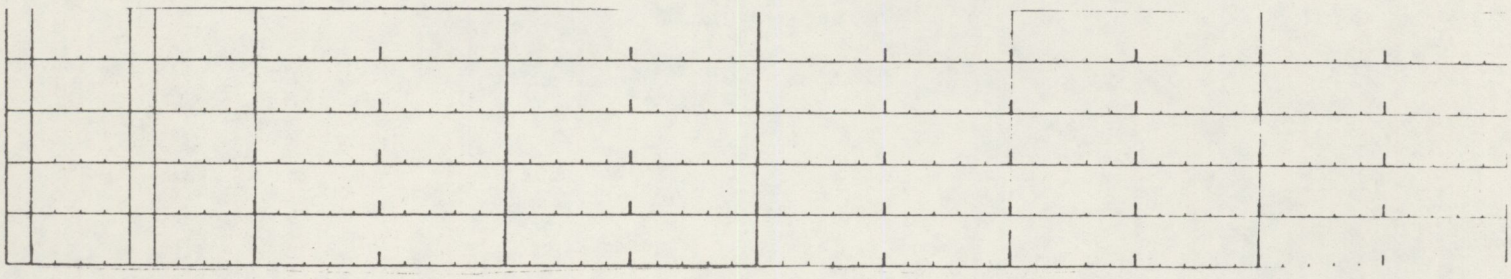
```
B=(A-1.)**2-2.
C=((A+B)*(A-B))/2.
KØRS=(A+2.*C)/(C-2.*B)/2.
```

(8 pts) 4. Consider the following card layout:

Card columns	Description	Form	Variable name
4-11	Item#	Integer	_____
31-40	Department	Alphanumeric	_____
41-45	Quantity	Integer	_____
48-53	Price	XXXX^XX	_____

(Decimal point not punched in the "Price" data field)

Define variable names and write FØRTRAN statements necessary to read this card and enter above data into memory registers associated with variable names.



G. Resinovic

Name _____

Section _____

K201 - Quiz 5D

(2 pts) 1. There are two categories of software. One is called the support software, and the other is _____ software.

(4 pts) 2. There are three major sources of software, one of them being the user. Name the other two sources of software.

_____ _____

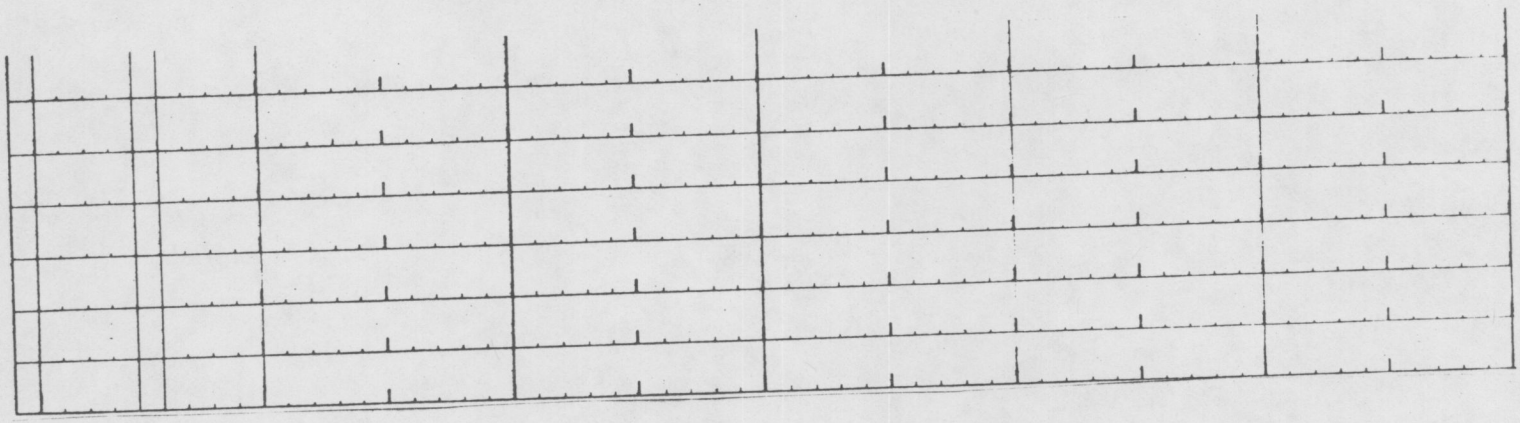
(2 pts) 3. BMD is an example of the _____ programs.

(4 pts) 4. We need three parameter cards to run BMDID program. Name two of them.

_____ _____

(8 pts) 5. We have a table stored in memory whose argument array IDEN contains 1000 employee identification numbers and whose function array R contains the pay rate of the associated employee. We have read an employee identification number NUM and the hours worked HRS from a card.

Write a program segment that will look up the employee number NUM in the table and compute the gross pay GPAY by multiplying hours worked HRS by appropriate pay rate. If the employee number NUM is not in the table, STØP. (You do not need to dimension the arrays, read a card, or print anything--just calculate GPAY or cause the program to STØP.)



G. Resinovic

Name_____

Section_____

K201-Quiz 2D
9/24/81

(2 pts) 1. Indicate and explain errors(if any) in the following FØRTRAN arithmetic statement:

```
A&123=(2-5L/AUTØ)**(K+1)/MØTØ*(*2-K)
```

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{(2A-1.)(2B+1.)-J1}{A^2-B} + (A+3.B)^2$$

(6 pts) 3. Evaluate the following sequence of FORTRAN statements, given A=3.:

```
B=(A-1.)**2-2.
C=((A+B)*(A-B))/2.
KØRS=(A+2.*C)/(C-2.*B)/2.
```

(8 pts) 4. Consider the following card layout:

card columns	Description	Form	Variable name
2-6	Sequence#	Integer	_____
11-23	Name	Alphanumeric	_____
24-25	Credit hours	Integer	_____
38-41	Points	XXX^X	_____

(Decimal point not punched in the data field "Points")

Define variable names and write FØRTRAN statements necessary to read this card and enter above data into memory registers associated with variable names.

G. Resinovic

Name_____

Section_____

K201-Quiz 2C
9/24/81

(2 pts) 1. Indicate and explain errors (if any) in the following FORTRAN arithmetic statement:

RAD ØN = (PET-PAUL)*3/(RAD-ØN+1)**5-INPUT)

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{(KAPA1-U)^2+5.5B}{A-THETA} \quad -R^{2+K}$$

(6 pts) 3. Evaluate the following sequence of FØRTRAN statements, given A=2.:

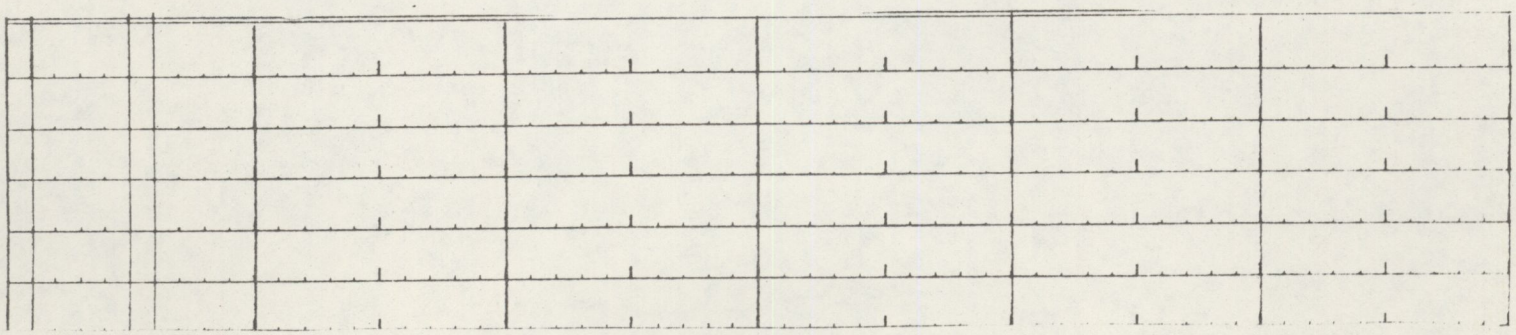
```
B=(A-1.)**2-2.
C=((A+B)*(A-B))/2.
KØRS=(A+2.*C)/(C-2.*B)/2.
```

(8 pts) 4. Consider the following card layout:

Card columns	Description	Form	Variable Names
2-10	Item#	Integer	_____
11-21	Department	Alphanumeric	_____
31-35	Quantity	Integer	_____
38-43	Price	XXXX^XX	_____

(Decimal point not punched in the "Price" data field)

Define variable names and write FØRTRAN statements necessary to read this card and enter above data into memory registers associated with variable names.



G. Resinovic

Name_____

Section _____

K201 - Quiz 1A
9/10/81

Each of the following questions counts 2 points.

1. Memory is a part of CPU. Name two other functional units which belong to CPU. _____

2. The physical components that make up the computer are referred to as _____.

3. Programs written in any programming language are called _____ programs. Compiler translates such programs into a _____ language program.

4. A FØRTRAN statement that is not translated into any instruction is called a _____ statement.

5. What is the maximum number of characters that can be recorded on a single punched card? _____

6. When an alphabetic data item doesn't fill the entire card data field, we usually align the data to the (which side) _____ and leave any blanks on the _____.

7. Identify the mode (or explain what is wrong if incorrect) of each of the following numbers.

   a) 3250000.

   b) 0.0

8. Each of the following are considered to be a FØRTRAN variable. If any of them is valid, indicate the mode, otherwise explain why it is not valid.

   a) CLASS#

   b) ACCOUNT

9. Perform the following calculations, using the FØRTRAN rules of arithmetic.

   a) (2-7/3)*2 =

   b) Let A=2.5, B=1., C=3.5
      C*(A+3.*B)-B*C =

10. Indicate the errors, if any, in the following FØRTRAN expressions.

    a) (ALPHA-(BETA*R**2.)/-GAMMA)/3*OMEGA

    b) (I+3)(I-5)/KAPPA-(1+KAPA**2.5)

G. Resinovic

Name_____

Section _____

K201 - Quiz 1B
9/9/81

Each of the following questions counts 2 points.

1. Control unit is a part of CPU. Name two other functional units which belong to CPU: _____

2. The programs that tell the computer what to do are referred to as _____.

3. Compiler translates the procedure-oriented language into _____ language. When program is translated, it is called an _____ program.

4. A FØRTRAN statement that is translated into one (or more) instruction(s) is called _____ statement.

5. According to the IBM card coding scheme, each letter is represented by (how many) _____ punches and a numeric digit by (how many)_____ punches in a card column.

6. When a numeric data item doesn't fill the entire card data field, we leave any blanks on the (which side) _____ and align the number to the _____.

7. Identify the mode (or explain what is wrong if incorrect) of each of the following numbers:

   a) -3.1459

   b) 0.0

8. Each of the following are considered to be a FØRTRAN variable. If any of them is valid, indicate the mode, otherwise explain why it is not valid!

   a) CASH$

   b) PAY-OFF

9. Perform the following calculations, using the FØRTRAN rules of arithmetic.

   a) (7-5/4)/3 =

   b) Let A=3.5, B=0.5, C=6.
   C*(A+5.*B)/(A-B)

10. Indicate the errors, if any, in the following FØRTRAN expressions:

    a) (A-(B*C**2)/2.6)***3

    b) I+5*(KØNTØ-7K)**(0.5)

G. Resinovic

Name _____

Section _____

K201 - Quiz 1D
9/10/81

Each of the following questions counts 2 points.

1. ALU is a part of CPU. Name two other functional units which belong to CPU:

   _____

2. A memory register that will store only one character is called a _____.

3. Each machine language instruction is composed of two parts. They are:

   _____

4. When a program is translated into a machine language, each variable name is associated with a specific _____ in the computer memory.

5. What is the maximum number of characters that can be recorded on a single card? _____

6. The arrangement of the card data fields in a particular application is called the _____.

7. Identify the mode (or explain what is wrong if incorrect) of each of the following numbers:

   a) 1000000.00+

   b) 0,000271

8. Each of the following are considered to be a FØRTRAN variable. If any of them is valid, indicate the mode, otherwise explain why it is not valid.

   a) SUMARUM

   b) GØØØ!

9. Perform the following calculations using the FØRTRAN rules of arithmetic.

   a) (2-7/3)/5 =

   b) Let A=2.5, B=1.5, C=3.
      C*(A+2.*B)/(A-B) =

10. Indicate the errors, if any, in the following FØRTRAN expressions.

    a) (A-(B+(C-D*(3*E-C)))-5.D)

    b) (I-27)**2-(K/L+1)**3(N-1)

G. Resinovic

Name_____

Section_____

K201-Quiz 2B
9/23/81

(2 pts) 1. Indicate and explain errors (if any) in the following FØRTRAN arithmetic statement:

```
A112=(2-3K/MØTØ)**PI/A+123)-K**2
```

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{(2A+1.)(2B-1.)-J1}{A+B^2} + (A-1.)^2$$

(6 pts) 3. Evaluate the following sequence of FØRTRAN statements, given A=4.:

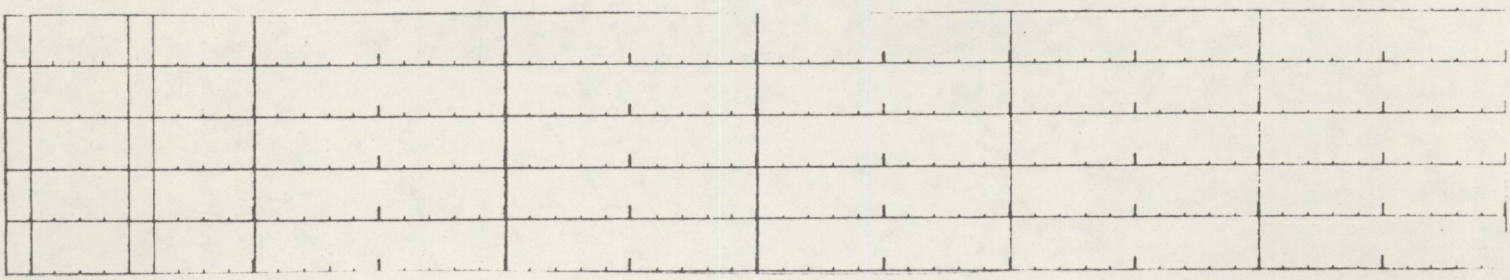
```
B=(A-2.)**2-2.
C=((A+B)*(A-B))/2.
KØRS=(A+2.*C)/(C-2.*B)/2.
```

(8 pts) 4. Consider the following card layout:

ard columns	Description	Form	Variable name
3-8	Sequence#	Integer	_____
11-25	Name	Alphanumeric	_____
26-27	Credit hours	Integer	_____
39-42	Points	XXX^X	_____

(Decimal point not punched in the data field "Points")

Define variable names and write FØRTRAN statements necessary to read this card and enter above data into memory registers associated with variable names.



G. Resinovic

Name_____

Section _____

K201 - Quiz 1C
9/9/81

Each of the following questions counts 2 points.

1. ALU is a part of CPU. Name two other functional units which belong to CPU:

   _____

2. In a memory, each register is identified by a number, called its _____.

3. Instruction which cause the computer to execute an instruction other than next in a sequence is called a _____ instruction.

4. Before it is executed the object program must be _____ into the computer memory.

5. The convention that associates a unique combination of punches with each character is called the punch card _____ _____.

6. There are (how many) _____ rows and (how many) _____ columns in a punched card.

7. Identify the mode (or explain what is wrong if incorrect) of each of the following numbers:

   a) -135

   b) 2,337.05

8. Each of the following are considered to be a FØRTRAN variable. If any of them is valid, indicate the mode, otherwise explain why it is not valid:

   a) K201

   b) BUDGAT

9. Perform the following calculations using the FØRTRAN rules of arithmetic:

   a) (8-1/2)/3 =

   b) Let A=2.5, B=0.5, C=5.
      C*(A-2.*B)/(A-B)

10. Indicate the errors, if any, in the following FØRTRAN expressions:

    a) (7*MEMO/(HOUR-2))**2

    b) (A-(B*C**2)/-3.3)**3

G. Resinovic

Name _____

Section _____

K201-Quiz 2A

(2 pts) 1. Indicate and explain errors (if any) in the following FØRTRAN arithmetic statement:

B&Co = (2.PI-X1**-2*(I+1)) /L23)

1. 2. 3. or 4.

1. special character in the variable
2. missing operator
3. operators not separated
4. unequal number of parentheses

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{(1-\frac{x^2}{y})(2-\sqrt{xy})}{2x^2-5y}+1$$

(1-X**2/Y)*(2.-(X*Y)**.5)/(2.*X**2-5.*Y)+1.

(6 pts) 3. Evaluate the following sequence of FORTRAN statements, given R1=3.:

R2=(3.5-R1 /2.)**2-1. $= (3.5-1.5)^2-1. = (2.)^2-1. = 4.-1. = 3.$

R3=(R2 **2-2.* R1)/3.+1. $= (3.^2-2*3.)/3.+1. = (9.-6.)/3.+1. = 3./3.+1. = 1.+1. = 2.$

K2R =(R1/ R2 +1.)/(R3-1.)+1.5*R2 $= (3./3.+1.)/(2.-1.)+1.5*3. = (1.+1.)/1.+4.5 = 2.+4.5 = 6$

(8 pts) 4. Consider the following card layout:

Card Columns	Description	Form	Variable name
10-14	Item #	Integer	INØ
15-33	Item name	Alphanumeric	N1, N2, N3, N4, N5
39-41	No. of items sold	Integer	NØIS
55-59	Unit price	XXX^XX	UP

a) define variable names

b) write FØRTRAN statements necessary to read a card with given layout.

```
      READ(5,3)INØ,N1,N2,N3,N4,N5,NØIS,UP
    3 FØRMAT(9X,I5,4A4,A3,5X,I3,13X,F5.2)
```

G. Resinovic

Name_____

Section_____

K201-Quiz 2A
9/23/81

(2 pts) 1. Indicate and explain errors(if any) in the following FØRTRAN arithmetic statement:

```
RAD.ØN=(PET-PAUL)**2/((RAD*ØN-1.)*5)-INPUT)
```

WRONG MODE
NOT ALLOWED
OR TOO MUCH

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\left(\frac{(27KAPU-U)^2+5.5B}{A+THETA}\right) - R^{2K}$$

WRONG MODE ADD. PARENTHESES NEEDED

```
((27.*AKAPU-U)**2+5.5*B)/(A+THETA)-R**(2*K)
```

(6 pts) 3. Evaluate the following sequence of FØRTRAN statements, given A=3.:

```
B=(A-1.)**2-2.      (3.-1.)^2-2. = 2.
C=((A+B)*(A-B))/2.  (3.+2.)(3.-2.)/2. = 25.
KØRS=(A+2.*C)/(C-2.*B)/2.  (3.+5.)/(5-4.)/2. = ~~6~~ -2
```

(8 pts) 4. Consider the following card layout:

Card columns	Description	Form	Variable name
4-11	Item#	Integer	_____
31-40	Department	Alphanumeric	_____
41-45	Quantity	Integer	_____
48-53	Price	XXXX^XX	_____

(Decimal point not punched in the "Price" data field)

Mode!
3variables!
Mode!
Mode!

Define variable names and write FØRTRAN statements necessary to read this card and enter above data into memory registers associated with variable names.

```
      READ(5,4),I,A1,A2,A3,I,D
4     FORMAT(3X,I8,19X,2A4,A2,I5,2X,F6.2)
```

G. Resinovic

Name_____

Section_____

K201-Quiz 2B
9/23/81

(2 pts) 1. Indicate and explain errors (if any) in the following FØRTRAN arithmetic statement:

A112=(2-3K/MØTØ)**PI/A+123)-K**2

* NOT ALLOWED WRONG MODE TOO MANY PAR.

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{((2A+1.)(2B-1.)-J1)}{A+B^2}+(A-1.)^2$$

.* .* CHANGE MODE ADD PARENTH.

((2.*A+1.)*(2.*B-1.)-AJ1)/(A+B**2)+(A-1.)**2

(6 pts) 3. Evaluate the following sequence of FØRTRAN statements, given A=4.:

B=(A-2.)**2-2. $(4.-2.)^2-2. = 2.$
C=((A+B)*(A-B))/2. $(4.+2.)(4.-2)/2. = 6.$
KØRS=(A+2.*C)/(C-2.*B)/2. $(4.+12.)/(6.-4.)/2. = 4$

(8 pts) 4. Consider the following card layout:

ard columns	Description	Form	Variable name	
3-8	Sequence#	Integer	_____	Mode!
11-25	Name	Alphanumeric	_____	4 variables!
26-27	Credit hours	Integer	_____	Mode!
39-42	Points	XXX^X	_____	Mode!

(Decimal point not punched in the data field "Points")

Define variable names and write FØRTRAN statements necessary to read this card and enter above data into memory registers associated with variable names.

```
READ(5,4),I,A1,A2,A3,A4,I,D
4 FØRMAT(2X,I6,3A4,A3,
4 FØRMAT(2X,I6,2X,3A4,A3,I2,11X,F4.1)
```

G. Resinovic

Name _____

Section _____

K201-Quiz 2C
9/24/81

(2 pts) 1. Indicate and explain errors (if any) in the following FORTRAN arithmetic statement:

```
RAD ØN = (PET-PAUL)*3/(RAD-ØN+1)**5-INPUT)
```

MODE

TOO MANY LEFT PARENTH.

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

CHANGE MODE

$$\frac{((KAPA1-U)^2+5.5B)}{A-THETA}-R^{(2+K)}$$

ADD. PARENTH.

PUT IN PARENTH.

```
((KAPA1-U)**2+5.5*B)/(A-THETA)-R**(2+K)
```

(6 pts) 3. Evaluate the following sequence of FØRTRAN statements, given A=2.:

```
B=(A-1.)**2-2.      (2.-1.)^2-2. = -1.
C=((A+B)*(A-B))/2.  (2.-1.)(2.+1.)/2. = 1.5
KØRS=(A+2.*C)/(C-2.*B)/2.   (2.+3.)/(1.5+2.)/2. = 0
```

(8 pts) 4. Consider the following card layout:

Card columns	Description	Form	Variable Names	
2-10	Item#	Integer	_____	Mode!
11-21	Department	Alphanumeric	_____	3 variables
31-35	Quantity	Integer	_____	Mode!
38-43	Price	XXXX^XX	_____	Mode!

(Decimal point not punched in the "Price" data field)

Define variable names and write FØRTRAN statements necessary to read this card and enter above data into memory registers associated with variable names.

```
      READ(5,4),I,A1,A2,A3,I,D
4     FØRMAT(1X,I9,2A4,A3,9X,5I,2X,F6.2)
                             I5
```

G. Resinovic

Name_____

Section_____

K201-Quiz (2D)
9/24/81

(2 pts) 1. Indicate and explain errors(if any) in the following FØRTRAN arithmetic statement:

NOT ALLOWED WRONG MODE NOT NEED

```
A&123=(2-5L/AUTØ)**(K+1)/MØTØ*(*2-K)
```

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

ADDITIONAL PARENTH.

$$\frac{(2A-1.)(2B+1.)-J1}{A^2-B} + (A+3.B)^2$$

CHANGE MODE

```
((2.*A-1.)*(2.*B+1.)-AJ1)/(A**2-B)+(A+3.*B)**2
```

(6 pts) 3. Evaluate the following sequence of FORTRAN statements, given A=3.:

```
B=(A-1.)**2-2.
C=((A+B)*(A-B))/2.
KØRS=(A+2.*C)/(C-2.*B)/2.
```

$(3.-1.)^2-2.=4.-2.=2.$

$(3.+2.)(3.-2.):2.=5.*1./2.=2.5$

$(3.+5.)/(2.5-4.)/2.=(8.)/(-1.5)/2.=-2$

(8 pts) 4. Consider the following card layout:

card columns	Description	Form	Variable name
2-6	Sequence#	Integer	_____
11-23	Name	Alphanumeric	_____
24-25	Credit hours	Integer	_____
38-41	Points	XXX^X	_____

mode!
4 variables!
mode!
mode!

(Decimal point not punched in the data field "Points")

Define variable names and write FØRTRAN statements necessary to read this card and enter above data into memory registers associated with variable names.

```
      READ(5,4),I,A1,A2,A3,A4,I,D
4     FØRMAT(1X,I5,4X,3A4,A1,I2,12X,F4.1)
```

G. Resinovic

Name _____

Section _____

K201 - Quiz 1D
9/10/81

Each of the following questions counts 2 points.

1. ALU is a part of CPU. Name two other functional units which belong to CPU:
   MEMORY, CONTROL UNIT

2. A memory register that will store only one character is called a BYTE.

3. Each machine language instruction is composed of two parts. They are:
   OPERATION CODE, ADDRESS

4. When a program is translated into a machine language, each variable name is associated with a specific REGISTER (or ADDRESS) in the computer memory.

5. What is the maximum number of characters that can be recorded on a single card? 80

6. The arrangement of the card data fields in a particular application is called the CARD LAYOUT.

7. Identify the mode (or explain what is wrong if incorrect) of each of the following numbers:

   a) 1000000.00(+) SIGN ON THE RIGHT NOT ALLOWED

   b) 0,000271 ~~DECIMAL~~ COMMAS NOT ALLOWED

8. Each of the following are considered to be a FØRTRAN variable. If any of them is valid, indicate the mode, otherwise explain why it is not valid.

   a) SUMARUM TOO MANY CHARACTERS

   b) GØØØ(!) SPECIAL CHARACTER NOT ALLOWED

9. Perform the following calculations using the FØRTRAN rules of arithmetic.

   a) (2-7/3)/5 = 0

   b) Let A=2.5, B=1.5, C=3.
      C*(A+2.*B)/(A-B) = 16.5

10. Indicate the errors, if any, in the following FØRTRAN expressions.

   a) (A-(B+(C-D*(3E-C)))-5.D) ↓ OPERATION (*) NOT SPECIFIED
      D.P. MISSING

   b) (I-27)**2-(K/L+1)**3(N-1)
      ↑ OPERATION (*) NOT SPECIFIED

G. Resinovic

Name _____

Section _____

K201 - Quiz 1C
9/9/81

Each of the following questions counts 2 points.

1. ALU is a part of CPU. Name two other functional units which belong to CPU:
   MEMORY, CONTROL UNIT

2. In a memory, each register is identified by a number, called its ADDRESS.

3. Instruction which cause the computer to execute an instruction other than next in a sequence is called a BRANCHING instruction.

4. Before it is executed the object program must be LOADED into the computer memory.

5. The convention that associates a unique combination of punches with each character is called the punch card CODING SCHEME.

6. There are (how many) 12 rows and (how many) 80 columns in a punched card.

7. Identify the mode (or explain what is wrong if incorrect) of each of the following numbers:

   a) -135 INTEGER

   b) 2,337.05

8. Each of the following are considered to be a FØRTRAN variable. If any of them is valid, indicate the mode, otherwise explain why it is not valid:

   a) K201 INTEGER

   b) BUDGAT DECIMAL

9. Perform the following calculations using the FØRTRAN rules of arithmetic:

   a) (8-1/2)/3 = 2

   b) Let A=2.5, B=0.5, C=5.
      C*(A-2.*B)/(A-B) 3.75

10. Indicate the errors, if any, in the following FØRTRAN expressions:

    a) (7*MEMO/(HOUR-2))**2 MIXED MODE

    b) (A-(B*C**2)/-3.3)**3 TWO SUBSEQUENT OPERATIONS

G. Resinovic

Name _____

Section _____

K201 - Quiz 1B
9/9/81

Each of the following questions counts 2 points.

1. Control unit is a part of CPU. Name two other functional units which belong to CPU: ARITHMETIC-LOGICAL UNIT (or ALU), MEMORY

2. The programs that tell the computer what to do are referred to as SOFTWARE.

3. Compiler translates the procedure-oriented language into MACHINE language. When program is translated, it is called an OBJECT program.

4. A FØRTRAN statement that is translated into one (or more) instruction(s) is called EXECUTABLE statement.

5. According to the IBM card coding scheme, each letter is represented by (how many) 2 punches and a numeric digit by (how many) 1 punches in a card column.

6. When a numeric data item doesn't fill the entire card data field, we leave any blanks on the (which side) LEFT and align the number to the RIGHT.

7. Identify the mode (or explain what is wrong if incorrect) of each of the following numbers:

   a) -3.1459 DECIMAL

   b) 0.0 DECIMAL

8. Each of the following are considered to be a FØRTRAN variable. If any of them is valid, indicate the mode, otherwise explain why it is not valid!

   a) CASH$

   b) PAY-OFF

9. Perform the following calculations, using the FØRTRAN rules of arithmetic.

   a) (7-5/4)/3 = 2

   b) Let A=3.5, B=0.5, C=6.
      C*(A+5.*B)/(A-B) 12

10. Indicate the errors, if any, in the following FØRTRAN expressions:

    a) (A-(B*C**2)/2.6)***3

    b) I+5*(KØNTØ-7K)**(0.5)

G. Resinovic

Name _____

Section _____

K201 Quiz 5 B

(2 pts) 1. There are two categories of software. One is called the support software and the other is APPLICATION software.

(2 pts) 2. The operating system is told how to process a job by means of a JOB CONTROL language.

(4 pts) 3. Translators are a part (or element) of support software. Name two other elements of support software:

any: OPERATING SYSTEM, COMMUNICATION INTERFACE, DATA(BASE) MNGM. ~~SERVICE PROGR.~~

(4 pts) 4. FINISH card is the last parameter card for a BMDID program. Name two other parameter cards necessary to run this program:

PROBLM, VARIABLE FORMAT

(2 pts) 5. An example of CANNED programs is BMD.

(4 pts) 6. In summarization process, data cards must be SORTED according to CONTROL VARIABLE.

(2 pts) 7. If we want to punch a summary card in summarization program, we must include a WRITE statement between _____.

G. Resinovic

Name _____

Section _____

K201 - Quiz 1A
9/10/81

Each of the following questions counts 2 points.

1. Memory is a part of CPU. Name two other functional units which belong to CPU. ARITHMETIC-LOGICAL UNIT (or ALU), CONTROL UNIT

2. The physical components that make up the computer are referred to as HARDWARE.

3. Programs written in any programming language are called SOURCE programs. Compiler translates such programs into a MACHINE language program.

4. A FØRTRAN statement that is not translated into any instruction is called a NON EXECUTABLE statement.

5. What is the maximum number of characters that can be recorded on a single punched card? 80

6. When an alphabetic data item doesn't fill the entire card data field, we usually align the data to the (which side) LEFT and leave any blanks on the RIGHT.

7. Identify the mode (or explain what is wrong if incorrect) of each of the following numbers.

   a) 3250000. DECIMAL

   b) 0.0 DECIMAL

8. Each of the following are considered to be a FØRTRAN variable. If any of them is valid, indicate the mode, otherwise explain why it is not valid.

   a) CLASS# NO SPECIAL CHARACTERS ALLOWED

   b) ACCOUNT TOO MANY CHARACTERS

9. Perform the following calculations, using the FØRTRAN rules of arithmetic.

   a) (2-7/3)*2 = 0

   b) Let A=2.5, B=1., C=3.5
      C*(A+3.*B)-B*C = 15.75

10. Indicate the errors, if any, in the following FØRTRAN expressions.

   a) (ALPHA-(BETA*R**2.)/-GAMMA)/3*OMEGA
      (Dec. Exponent) ↓ TWO SUBSEQUENT OPERATIONS
      MISSING D.P.

   b) (I+3)(I-5)/KAPPA-(1+KAPA**2.5)
      ↑ MISSING OPERATION (*) → DECIMAL EXPONENT NOT ALLOWED

G. Resinovic

Name _____

Section KEY

K201 Quiz 5A

(2 pts) 1. The language we use to prepare control cards is called a JOB CONTROL language.

(4 pts) 2. There are three major sources of software, one of them being the computer manufacturer. Name the other two sources of software: SOFTWARE COMP. USERS.

(2 pts) 3. Programmers who produce and maintain the user programs are called the APPLICATION programmers.

(2 pts) 4. BMD is an example of the CANNED program.

(4 pts) 5. We need five parameter cards to run BMD5D program. Name two of them: any of: PROBLM, SELECT, VARIABLE FORMAT, HEADING, FINISH

(4 pts) 6. What is information?
DATA TRANSFORMED INTO A FORM WHERE IT IS USEFUL

(2 pts) 7. If we want to print a line for each input card in summarization program, we must include a WRITE statement before BLOCK 80 (after Bl. 60).

G. Resinovic

Name _____

Section KEY

K201 Quiz 5A

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(4 pts) 6. What is information?
DATA TRANSFORMED INTO A FORM WHERE IT IS USEFUL

(2 pts) 7. If we want to print a line for each input card in summarization program, we must include a WRITE statement before BLOCK 80 (after 61.60)

G. Resinovic

Name _____

Section _____

K201 - Quiz 5C

(2 pts) 1. There are two categories of software. One is called the application software, and the other is _____ software.

(4 pts) 2. There are three major sources of software, one of them being the computer manufacturer. Name the other two sources of software.

_____ _____

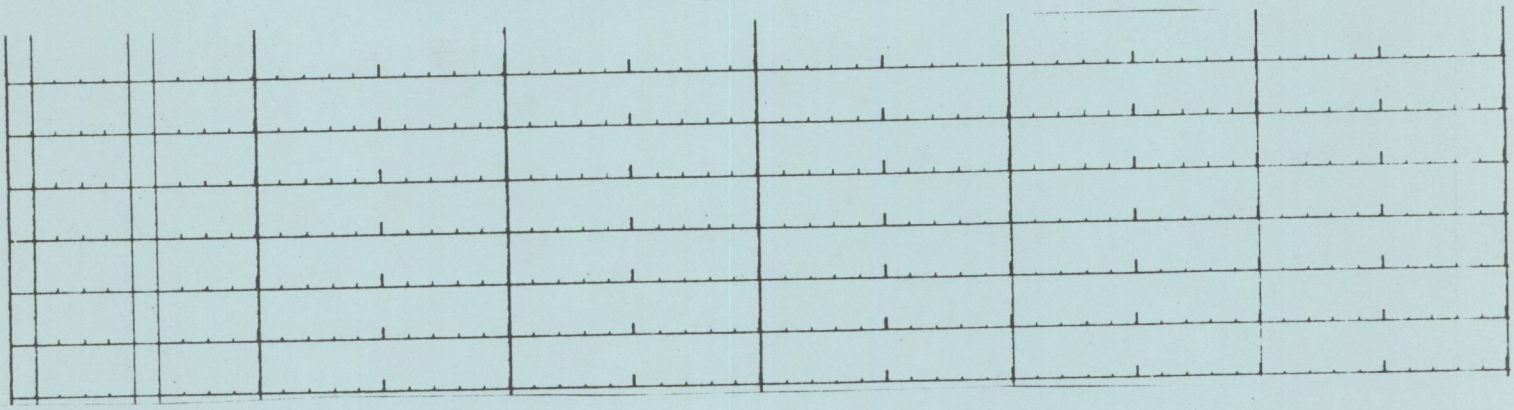
(2 pts) 3. BMD is an example of the _____ programs.

(4 pts) 4. We need five parameter cards to run BMD5D program. Name two of them.

_____ _____

(8 pts) 5. We have a table stored in memory whose argument array IDN contains 621 employee identification numbers and whose function array RT contains the pay rate of the associated employee. We have read an employee identification number NUM and the hours worked HRS from a card.

Write a program segment that will look up the employee number NUM in the table and compute the gross pay GPAY by multiplying hours worked HRS by appropriate pay rate. If the employee number NUM is not in the table, STØP. (You do not need to dimension the arrays, read a card, or print anything--just calculate GPAY or cause the program to STØP).



G. Resinovic Name_____

K201 - Quiz 5A

(2 pts) 1. The operating system is told how to process a job by means of a

_____ _____ language.

(4 pts) 2. Communication interface software is a part of support software. List two other groups of programs which we consider as a part of support software.

_____ _____

(2 pts) 3. Programmers who produce and maintain the user programs are called the

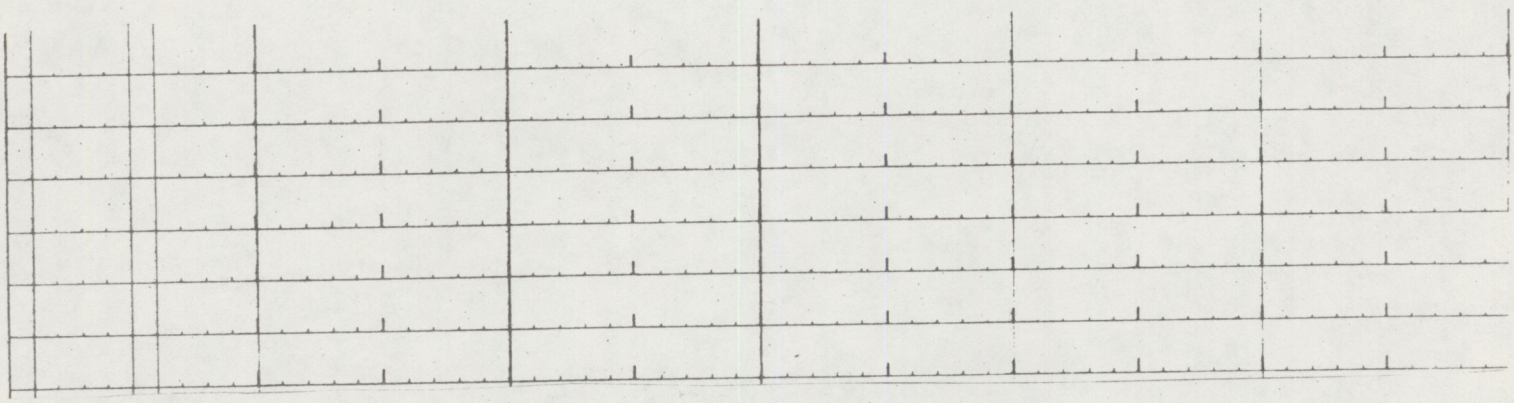
_____ programmers.

(4 pts) 4. Finish card is the last parameter card for a BMDID program. Name two other parameter cards necessary to run this program.

_____ _____

(8 pts) 5. We have a table stored in memory whose argument array INØ contains 256 employee identification numbers and whose function array PR contains the pay rate of the associated employee. We have read an employee identification number NUM and the hours worked HRS from a card.

Write a program segment that will look up the employee number NUM in the table and compute the gross pay GPAY by multiplying hours worked HRS by appropriate pay rate. If the employee number NUM is not in the table, STØP. (You do not need to dimension the arrays, read a card, or print anything--just calculate GPAY or cause the program to STOP).



G. Resinovic

Name _____

Section _____

K201-Quiz 2A

(2 pts) 1. Indicate and explain errors (if any) in the following FØRTRAN arithmetic statement:

```
B&Co = (2.PI-X1**-2*(I+1)) /L23)
```

1. 2. 3. or 4.

1. special character in the variable
2. missing operator
3. operators not separated
4. unequal number of parentheses

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{(1-\frac{x^2}{y})\cdot(2-\sqrt{xy})}{2x^2-5y}+1$$

(1-X**2/Y)*(2.-(X*Y)**.5)/(2.*X**2-5.*Y)+1.

(6 pts) 3. Evaluate the following sequence of FORTRAN statements, given R1=3.:

R2=(3.5-R1 /2.)**2-1. $= (3.5-1.5)^2-1. = (2.)^2-1. = 4.-1. = 3.$

R3=(R2 **2-2.* R1)/3.+1. $= (3.^2-2*3.)/3.+1. = (9.-6.)/3.+1. = 3./3.+1. = 1.+1. = 2.$

K2R =(R1/ R2 +1.)/(R3-1.)+1.5*R2 $= (3./3.+1.)/(2.-1.)+1.5*3. = (1.+1.)/1.+4.5 = 2.+4.5 = 6$

(8 pts) 4. Consider the following card layout:

Card Columns	Description	Form	Variable name
10-14	Item #	Integer	INØ
15-33	Item name	Alphanumeric	N1, N2, N3, N4, N5
39-41	No. of items sold	Integer	NØIS
55-59	Unit price	XXX^XX	UP

a) define variable names

b) write FØRTRAN statements necessary to read a card with given layout.

```
      READ(5,3)INØ,N1,N2,N3,N4,N5,NØIS,UP
    3 FØRMAT(9X,I5,4A4,A3,5X,I3,13X,F5.2)
```

G. Resinovic

Name _____

SSN _____

K201 - Quiz 1B
1/21/82

Each of the following questions counts 2 points.

1. What is the maximum number of characters that can be recorded on a single punched card? 80

2. According to card coding scheme, each letter of the alphabet is represented by (how many) 2 holes in a column.

3. Control unit is a part of CPU. Name two other functional units which belong to CPU: ALU MEMORY

4. The physical components that make up the computer are referred to as HARDWARE.

5. A FORTRAN statement that is not translated into any instruction is called a NONEXECUTABLE statement.

6. When an alphabetic data item doesn't fill the entire card data field, we usually align the data to the (which) LEFT side and leave any blanks on the RIGHT.

7. Identify the mode (or explain what is wrong if incorrect) of each of the following constants:

   a. -2,166.44 COMMA NOT ALLOWED

   b. 0.0 DECIMAL

8. Each of the following are considered to be a FORTRAN variable. If any of them is valid indicate the mode, otherwise explain why it is not valid.

   a. QUIZ1B DECIMAL

   b. KARPET INTEGER

9. Perform the following calculations using the FORTRAN rules of arithmetic:

   a. (13-5/8)/7 = 1 $(13-0)/7 = 13/7 = 1$

   b. Let: GAMMA=3.5, E=.1, RADIAN=2.
   1.2*(RADIAN-5.*E*GAMMA)/(RADIAN-GAMMA) = -.2

   $1.2*(2.-5.*.1*3.5)/(2.-3.5) =$
   $= 1.2*(2.-1.75)/(-1.5) =$
   $= .3/(-1.5) = -.2$

10. Indicate the errors, if any, in the following FORTRAN expressions:

    a. X22-(3.3*NEMO**2(K-1)+A)/B-B1
    1. MIXED MODES (NEMO IS INTEGER VAR
    2. MISSING OPERATOR (2(K-1)

    b. ((K-3*KK/(IMIGE+5)-K**5)
    1. TOO MANY PARENTHESES
    2. INTEGER RAISED TO A DECIMAL POWER

G. Resinovic

Name _____

Section _____

K201-Quiz 2B

(2 pts) 1. Indicate and explain errors (if any) in the following FØRTRAN arithmetic statement:

```
INTEGER= -(2*BAL-1./-BIL(6.+3.5A)
```

1. too many characters in variable
2. missing decimal point
3. operations not separated
4. missing operation
5. unequal number of parentheses

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{(x^3-3xy)\sqrt{x-y}}{x+y^2}+1$$

```
(X**3-3.*X*Y)*(X-Y)**.5/(X+Y**2)+1.
```

(6 pts) 3. Evaluate the following sequence of FORTRAN statements, given SØM=3.:

```
PART=(3.5-SØM/2.)**2-1.
EX  =(PART**2-2.*SØM)/3.+1.
K2R =(SØM/PART+1.)/(EX-1.)+1.5*PART
```

3. 2. 6

(8 pts) 4. Consider the following card layout:

Card Columns	Description	Form	Variable name
3-11	Student ID	Integer	ID
20-37	Name	Alphanumeric	N1, N2, N3, N4, N5
38	Class code	Integer	IC
44-46	GPA	X.XX	GPA

a) define variable names

b) write FØRTRAN statements necessary to read a card with given layout.

```
      READ(5,6)ID,N1,N2,N3,N4,N5,IC,GPA
    6 FØRMAT(2X,I9,8X,4A4,A2,I1,5X,F3.2)
```

G. Resinovic

Name _____

Section # _____

K201 - Quiz 3B

For each employee in BEC company a card is punched with the following data:

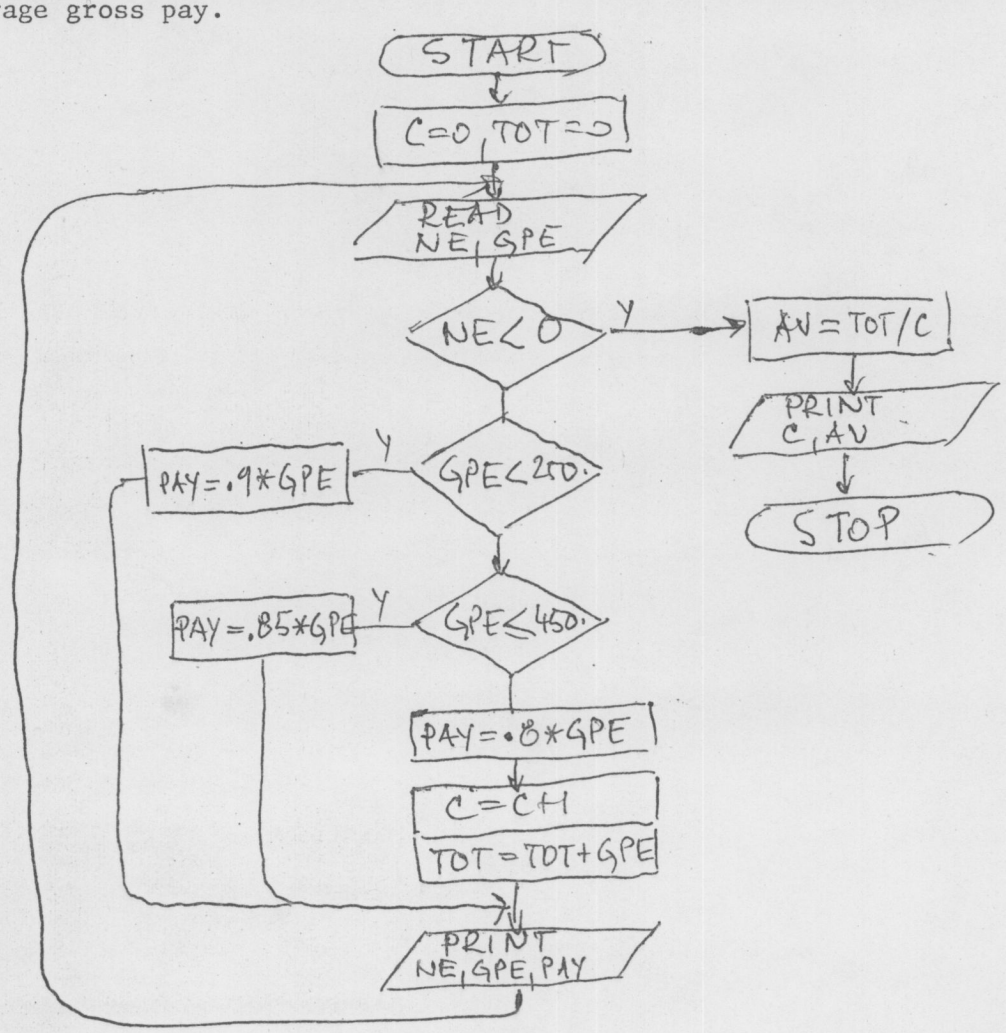
Card column	Description	Form	Variable Name
5-11	Employee #	Integer	NE
15-19	Weekly gross pay	XXX^XX	GPE

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.



G. Resinovic

Name _____

Section _____

K201-Quiz 2B

(2 pts) 1. Indicate and explain errors (if any) in the following FØRTRAN arithmetic statement:

```
INTEGER= -(2*BAL-1./-BIL(6.+3.5A)
```

1. too many characters in variable
2. missing decimal point
3. operations not separated
4. missing operation
5. unequal number of parentheses

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{(x^3-3xy)\sqrt{x-y}}{x+y^2}+1$$

```
(X**3-3.*X*Y)*(X-Y)**.5/(X+Y**2)+1.
```

(6 pts) 3. Evaluate the following sequence of FORTRAN statements, given SØM=3.:

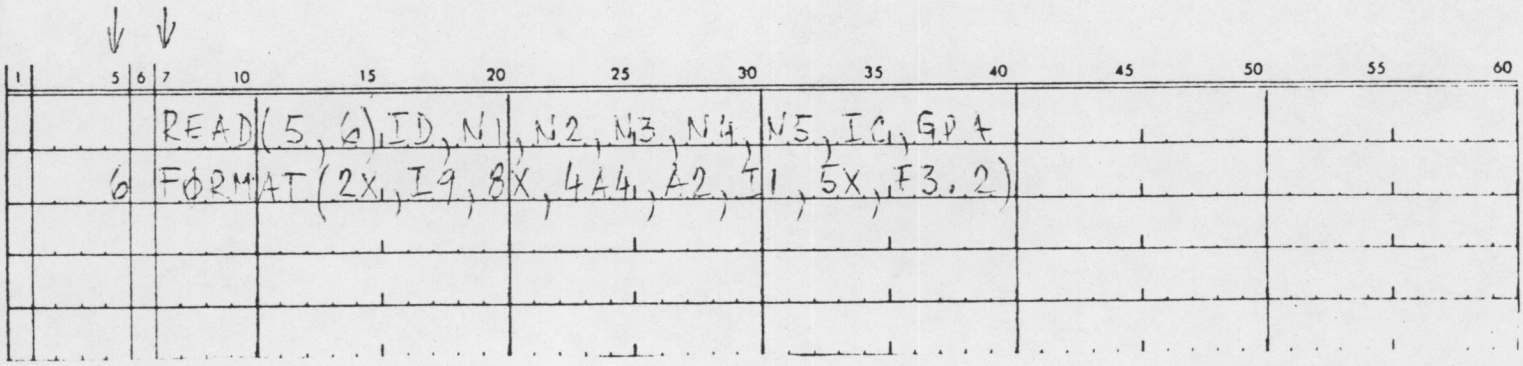
```
PART=(3.5-SØM/2.)**2-1.      3.
EX  =(PART**2-2.*SØM)/3.+1.  2.
K2R =(SØM/PART+1.)/(EX-1.)+1.5*PART  6.
```

(8 pts) 4. Consider the following card layout:

Card Columns	Description	Form	Variable name
3-11	Student ID	Integer	ID
20-37	Name	Alphanumeric	N1, N2, N3, N4, N5
38	Class code	Integer	IC
44-46	GPA	XXX	GPA

a) define variable names

b) write FØRTRAN statements necessary to read a card with given layout.



G. Resinovic

Name _____

Section # _____

K201 - Quiz 3A

KEY

For each employee in ABR company a card is punched with the following data:

Card Column	Description	Form	Variable Name
1-6	Employee #	Integer	NUM
10-14	Weekly gross pay	XXX^XX	WGP

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.

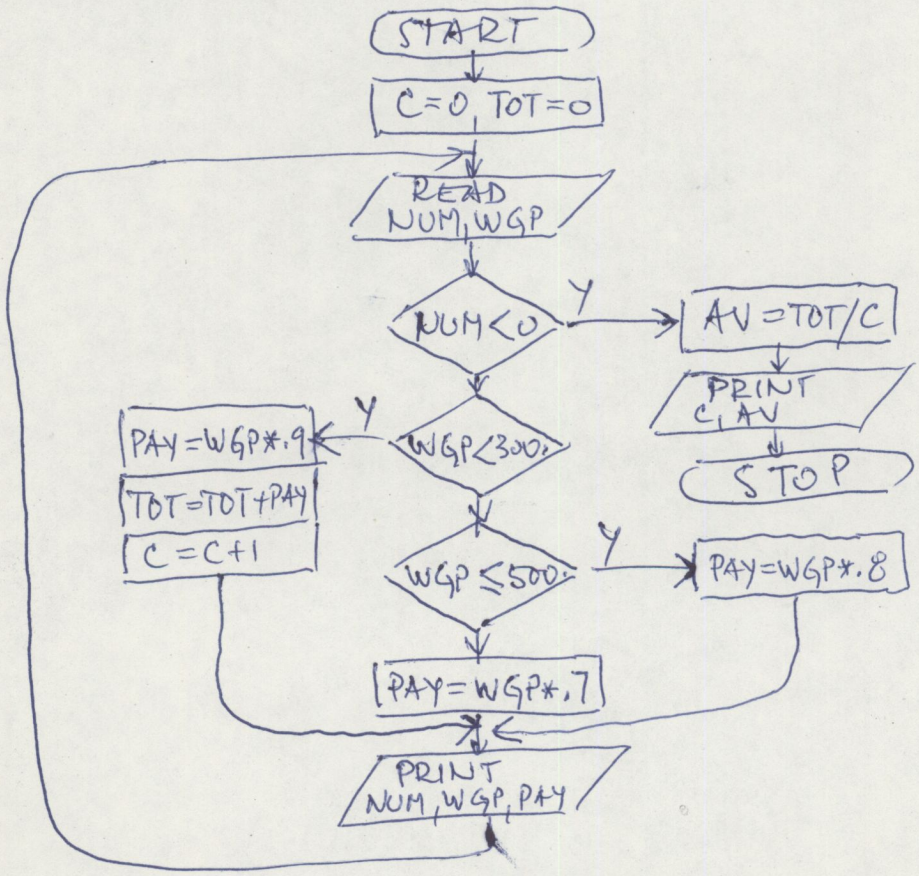
Net pay = gross pay - income tax

where: income tax is 10% of gross pay if gross pay is less than $300

is 20% of gross pay if gross pay is between $300 and $500 inclusive

is 30% of gross pay if gross pay is over $500

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 less than $300 and their average net pay.



K201-Quiz(D)

G. Resinovic

Name_____
Sec._____

For each street traffic accident in Aba county a report is prepared and data from the report are punched into a card according to the following card layout:

Card Column	Description	Variable Name
1-5	File number	
35-36	Year } Date	
37-38	Month } of	
39-40	Day } Accident	
42	Place of Accident (1-in town, 2-outside town)	
43	Cause of accident (1-Illegal Passing, 2-Negligence, 3-Alcohol)	
44	Type of Vehicle (1-bicycle, 2-motor, 3-car, 4-truck, 5-bus)	
46-52	Damage (in $) xxxxx$_{\wedge}$xx	
53-54	Number of Injured	
55-78	Name of Driver	

The data card deck is available for the last and the current year accidents. The last card in this deck has a negative number punched in data field "file number."

Prepare a flowchart for a program to list the name of car drivers involved in accidents caused by alcohol where one or more persons were injured and print the total number of persons injured in that conditions.

G. Resinovic

Name_____

Section_____

K201-Quiz 2B

(2 pts) 1. Indicate and explain errors (if any) in the following FØRTRAN arithmetic statement:

```
INTEGER= -(2*BAL-1./-BIL(6.+3.5A)
```

(4 pts) 2. Translate the following mathematical expression into an equivalent FØRTRAN expression:

$$\frac{(x^3-3xy)\sqrt{x-y}}{x+y^2}+1$$

(6 pts) 3. Evaluate the following sequence of FORTRAN statements, given SØM=3.:

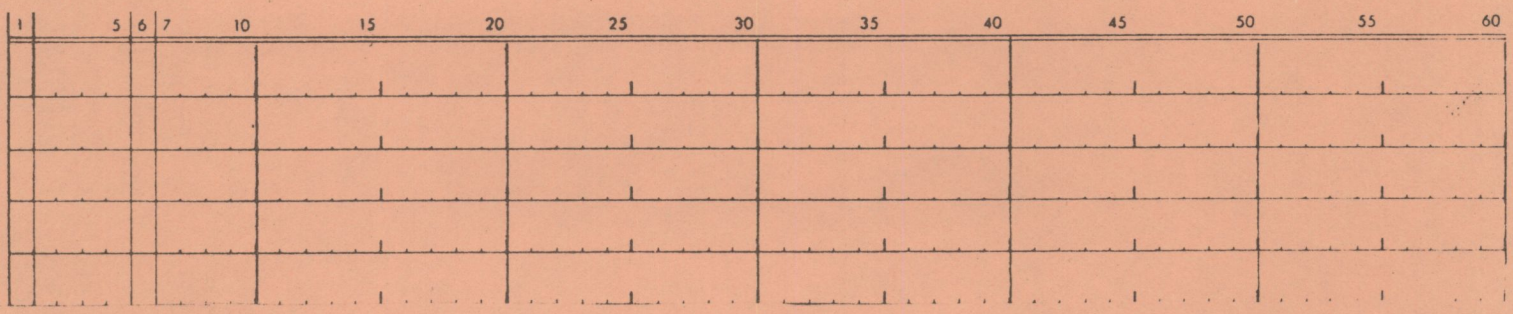
```
PART=(3.5-SØM/2.)**2-1.
EX  =(PART**2-2.*SØM)/3.+1.
K2R =(SØM/PART+1.)/(EX-1.)+1.5*PART
```

(8 pts) 4. Consider the following card layout:

Card Columns	Description	Form	Variable name
3-11	Student ID	Integer	_____
20-37	Name	Alphanumeric	_____
38	Class code	Integer	_____
44-46	GPA	X^XX	_____

a) define variable names

b) write FØRTRAN statements necessary to read a card with given layout.



K201-Quiz 3(A)

G. Resinovic

Name_____
Sec._____

For each street traffic accident in Aba county a report is prepared and data from the report are punched into a card according to the following card layout:

Card Column	Description	Variable Name
1-5	File number	
35-36	Year } Date	
37-38	Month } of	
39-40	Day } Accident	
42	Place of Accident (1-in town, 2-outside town)	
43	Cause of accident (1-Illegal Passing, 2-Negligence 3-Alcohol)	
44	Type of Vehicle (1-bicycle, 2-motor, 3-car, 4-truck, 5-bus)	
46-52	Damage (in $) xxxxx.xx	
53-54	Number of Injured	
55-78	Name of Driver	

The data card deck is available for the last and the current year accidents. The last card in this deck has a negative number punched in data field "file number."

Prepare a flowchart for a program to find out what was the average damage of outside town accidents caused by alcohol in the year 1980 and print this value.

K201-Quiz 3(B)

G. Resinovic

Name_____
Sec._____

For each street traffic accident in Aba county a report is prepared and data from the report are punched into a card according to the following card layout:

Card Column	Description	Variable Name
1-5	File number	
35-36	Year } Date	
37-38	Month } of	
39-40	Day } Accident	
42	Place of accident (1-in town, 2-outside town)	
43	Cause of accident (1-Illegal Passing, 2-Negligence, 3-Alcohol)	
44	Type of Vehicle (1-bicycle, 2-motor, 3-car, 4-truck, 5-bus)	
46-52	Damage (in $) xxxxx$_{\wedge}$xx	
53-54	Number of injured	
55-78	Name of driver	

The data card deck is available for the last and the current year accidents. The last card in this deck has a negative number punched in data field "File number."

Prepare a flowchart for a program to find out what was the average damage of in-town truck accidents caused by Illegal Passing and print this value.

G. Resinovic Name_____

K201 - Quiz 5B

(2 pts) 1. The language we use to prepare our control cards is called a _____

_____ language.

(4 pts) 2. Translators are a part of support software. List two other groups of programs which we consider as a part of support software.

_____ _____

(2 pts) 3. Programmers who produce and maintain the support software are called the

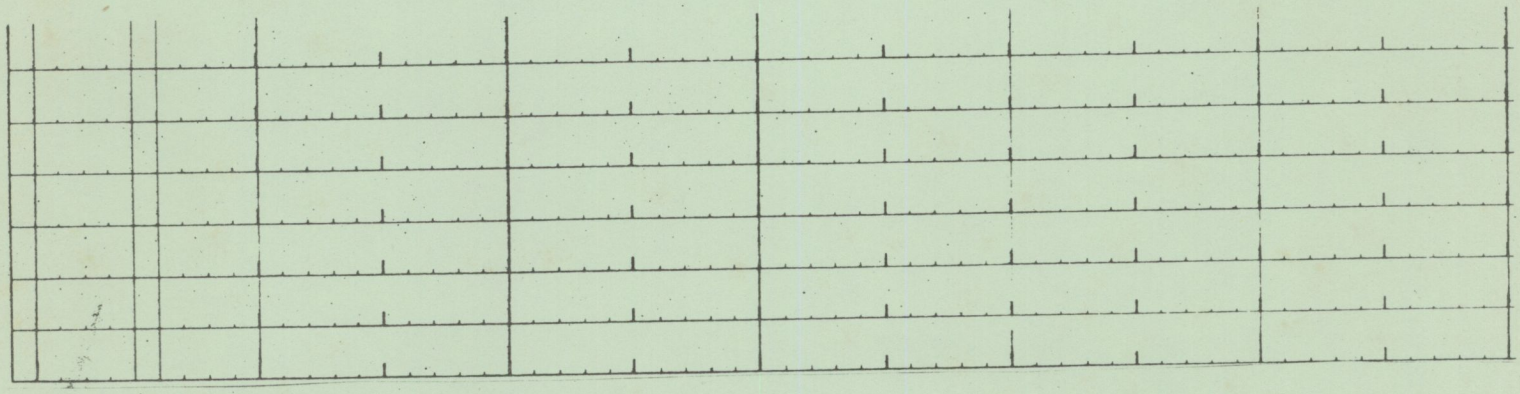
_____ programmers.

(4 pts) 4. There are five parameter cards necessary to run BMDED program. Name two of them.

_____ _____

(8 pts) 5. We have a table stored in memory whose argument array NSS contains 78 employee identification numbers and whose function array RATE contains the pay rate of the associated employee. We have read an employee identification number NUM and the hours worked HRS from a card.

Write a program segment that will look up the employee number NUM in the table and compute the gross pay GPAY by multiplying hours worked HRS by appropriate pay rate. If the employee number NUM is not in the table, STØP. (You do not need to dimension the arrays, read a card, or print anything--just calculate GPAY or cause the program to STOP).



G. Resinovic

Name _____

Section _____

K201 - Quiz 5D

(2 pts) 1. There are two categories of software. One is called the support software, and the other is _____ software.

(4 pts) 2. There are three major sources of software, one of them being the user. Name the other two sources of software.

_____ _____

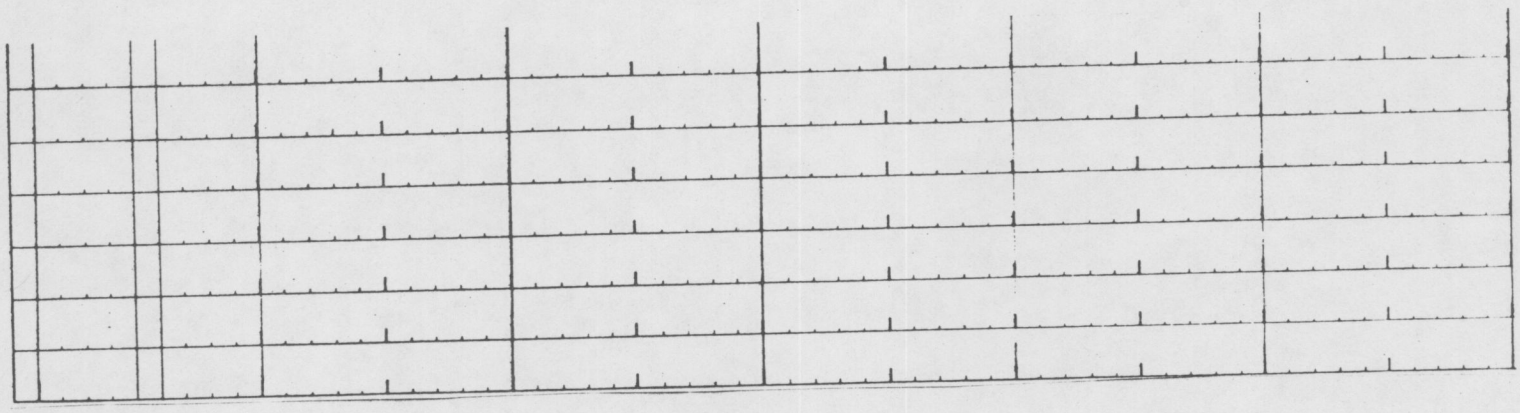
(2 pts) 3. BMD is an example of the _____ programs.

(4 pts) 4. We need three parameter cards to run BMDID program. Name two of them.

_____ _____

(8 pts) 5. We have a table stored in memory whose argument array IDEN contains 1000 employee identification numbers and whose function array R contains the pay rate of the associated employee. We have read an employee identification number NUM and the hours worked HRS from a card.

Write a program segment that will look up the employee number NUM in the table and compute the gross pay GPAY by multiplying hours worked HRS by appropriate pay rate. If the employee number NUM is not in the table, STØP. (You do not need to dimension the arrays, read a card, or print anything--just calculate GPAY or cause the program to STØP.)



G. Resinovic

Name _____

Section _____

K201 - Quiz 5C

(2 pts) 1. There are two categories of software. One is called the application software, and the other is _____ software.

(4 pts) 2. There are three major sources of software, one of them being the computer manufacturer. Name the other two sources of software.

_____ _____

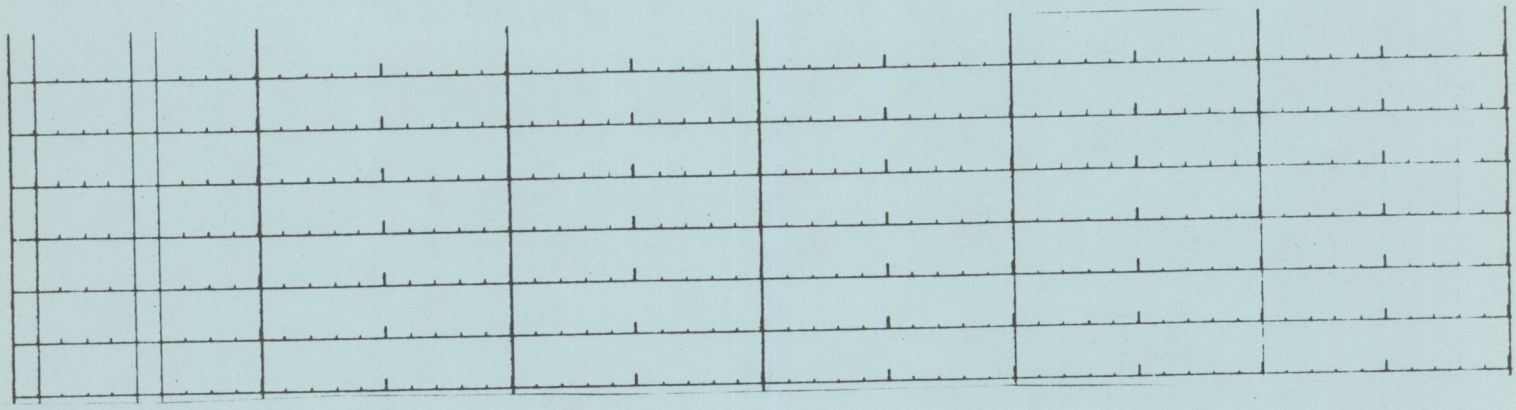
(2 pts) 3. BMD is an example of the _____ programs.

(4 pts) 4. We need five parameter cards to run BMD5D program. Name two of them.

_____ _____

(8 pts) 5. We have a table stored in memory whose argument array IDN contains 621 employee identification numbers and whose function array RT contains the pay rate of the associated employee. We have read an employee identification number NUM and the hours worked HRS from a card.

Write a program segment that will look up the employee number NUM in the table and compute the gross pay GPAY by multiplying hours worked HRS by appropriate pay rate. If the employee number NUM is not in the table, STØP. (You do not need to dimension the arrays, read a card, or print anything--just calculate GPAY or cause the program to STØP).



G. Resinovic Name_____

K201 - Quiz 5B

(2 pts) 1. The language we use to prepare our control cards is called a _____

_____ language.

(4 pts) 2. Translators are a part of support software. List two other groups of programs which we consider as a part of support software.

_____ _____

(2 pts) 3. Programmers who produce and maintain the support software are called the

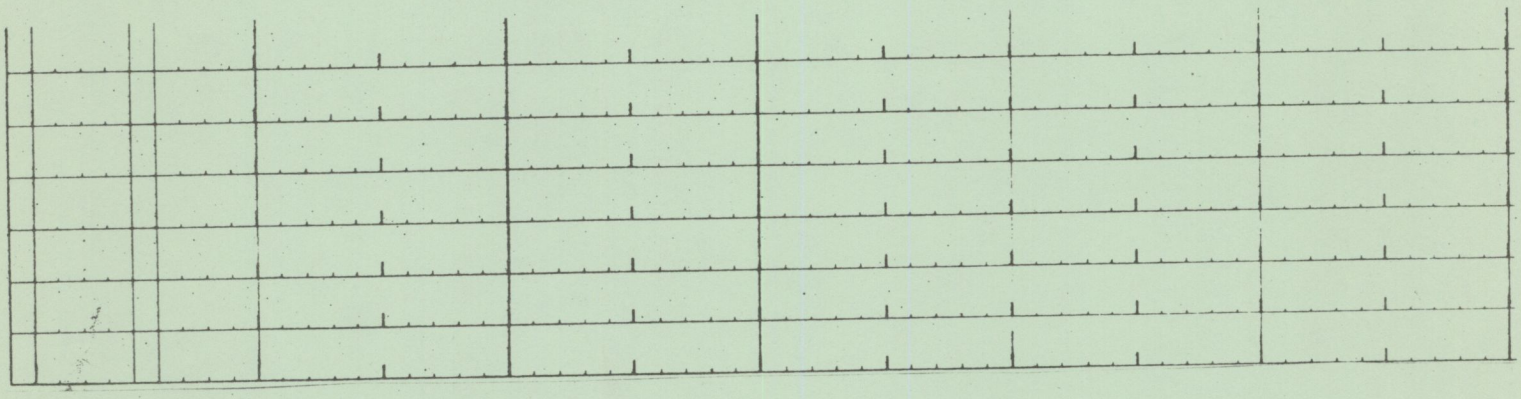
_____ programmers.

(4 pts) 4. There are five parameter cards necessary to run BMDED program. Name two of them.

_____ _____

(8 pts) 5. We have a table stored in memory whose argument array NSS contains 78 employee identification numbers and whose function array RATE contains the pay rate of the associated employee. We have read an employee identification number NUM and the hours worked HRS from a card.

Write a program segment that will look up the employee number NUM in the table and compute the gross pay GPAY by multiplying hours worked HRS by appropriate pay rate. If the employee number NUM is not in the table, STØP. (You do not need to dimension the arrays, read a card, or print anything--just calculate GPAY or cause the program to STOP).



G. Resinovic Name_____

K201 - Quiz 5A

(2 pts) 1. The operating system is told how to process a job by means of a

_____ _____ language.

(4 pts) 2. Communication interface software is a part of support software. List two other groups of programs which we consider as a part of support software.

_____ _____

(2 pts) 3. Programmers who produce and maintain the user programs are called the

_____ programmers.

(4 pts) 4. Finish card is the last parameter card for a BMDID program. Name two other parameter cards necessary to run this program.

_____ _____

(8 pts) 5. We have a table stored in memory whose argument array INØ contains 256 employee identification numbers and whose function array PR contains the pay rate of the associated employee. We have read an employee identification number NUM and the hours worked HRS from a card.

Write a program segment that will look up the employee number NUM in the table and compute the gross pay GPAY by multiplying hours worked HRS by appropriate pay rate. If the employee number NUM is not in the table, STØP. (You do not need to dimension the arrays, read a card, or print anything--just calculate GPAY or cause the program to STOP).

G. Resinovic

Name_____

Section # _____

K201 - Quiz 3B

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^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.