K201: The Computer in Business

Final Departmental Exam (B)

December 16, 1981

Signature _____

Name _____

Student Number _____

Instructor's Name _____

Section Number _____

This exam is worth 150 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.

The following 17 questions are worth 3 points each.

_____1. Direct access files are maintained on the following type of device.

a. magnetic access.
b. magnetic character.
c. magnetic disk.
d. magnetic tape.
e. none of the above

_____2. The operating system is told what to do by means of the:

a. data manipulation language.
b. compiler program.
c. job control language.
d. FORTRAN statements.
e. none of the above

_____3. Which of the following constants is invalid in FORTRAN?

a. +523.1
b. 0
c. -.077
d. 5,421
e. none of the above

_____4. When using a direct access file, one must locate the proper record in the file on the basis of a given value for the identification number of the desired record. The method by which the desired record is located is referred to as the file

a. organization.
b. conversion.
c. initialization.
d. terminal.
e. none of the above.

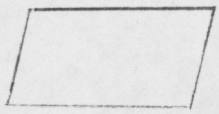
_____5. In a table, the function is:

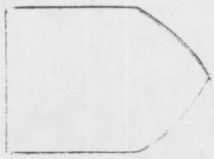
a. the array that stores the values of the data element by which the table is entered.
b. the variable that is obtained from the table to be used in subsequent calculations.
c. the array that stores the values that are obtained from the table.
d. the variable that represents the value that is used to locate the desired line in the table.
e. none of the above.

_____6. A programmer who develops support software is called

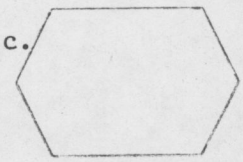
a. a systems programmer.
b. a support programmer.
c. an applications programmer.
d. a systems analyst.
e. none of the above

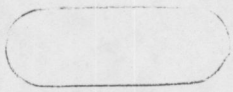
_____7. In a program flow chart, which of the following outlines is used to indicate the beginning of a DØ loop?

a. 

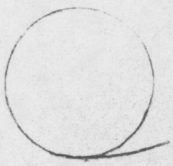
b. 

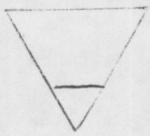
e. none of the above

c. 

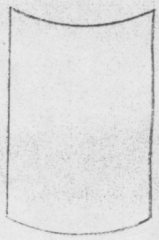
d. 

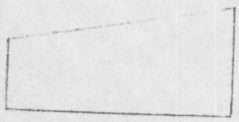
_____8. In a system flow chart, which of the following outlines represents a direct access file?

a. 

b. 

e. none of the above

c. 

d. 

_____9. If the number 127.48 is stored in the computer as the value for the variable AMT, the output that would result when the variable AMT is printed according to the format specification F5.2 is:

a. *****
b. 127.4
c. 127.5
d. 127.48
e. none of the above

_____10. Which of the following functions <u>is</u> <u>not</u> performed by the operating system?

a. initiating and terminating jobs.
b. communication with the computer operator.
c. data management.
d. program maintenance.
e. none of the above

_____11. Consider the following program segment

```
   K=0
 9 READ(5,10)QZ
10 FORMAT(F5.0)
   IF(QZ.GT.20.)GOTO15
   GO TO 9
15 K=K+1
```

This program segment contains

a. a condition controlled loop.
b. a count controlled loop.
c. an infinite loop.
d. an uncontrolled loop.
e. no loop.

_____12. In order to determine the economic feasibility of a data processing system, we must develop a preliminary system design and then decide whether or not

a. The benefits from the system are greater than the cost of developing the system.
b. The benefits from the system are greater than the sum of the cost of developing the system plus the cost of running the system.
c. The difference between the benefits from using the system minus the cost of running the system is large enough to justify the cost of developing the system.
d. The benefits from the system are greater than the costs of running the system.
e. none of the above

_____13. In a system using sequential access (magnetic tape) files

a. we use terminals to inquire about the status of file records.
b. we update a file record, change it, and write it back on the same tape.
c. in order to update the file we must collect a batch of transactions and sort them into the same sequence as the file.
d. we use index tables to locate the file record that corresponds to a given control key.
e. none of the above.

_____14. Which operation would be performed first when the following FORTRAN expression is executed

```
M**2-2*K/(3+L)+4
```

a. Dividing by 3+L
b. Adding 3 and L
c. Exponentiation
d. Adding 4
e. none of the above

_____15. Which of the following is an invalid FORTRAN variable name?

a. K-201
b. X100
c. STING
d. ND4$K3
e. none of the above

_____16. When a record in a direct access file is revised or updated

a. a new record is written in a different place in the file.
b. the new record is written in the same place where the old record was located, thus destroying the old record.
c. the data elements to be changed are modified without reading or writing the other data elements in the record.
d. the new record is written on an output tape, and the old record on the input tape is available for file reconstruction.
e. none of the above

_____17. Consider FORTRAN execution time diagnostics. The fact that a decimal quantity was printed with an integer mode specification is indicated by printing the following symbol in the output field.

a. *
b. X
c. @
d. I
e. none of the above

(3pts) 18. Evaluate the following expression when

I = 2 and J = 4

M = I**2/3*J M= _____

(4 pts) 19. Translate the following mathematical expression into an equivalent FORTRAN expression, taking care not to mix modes.

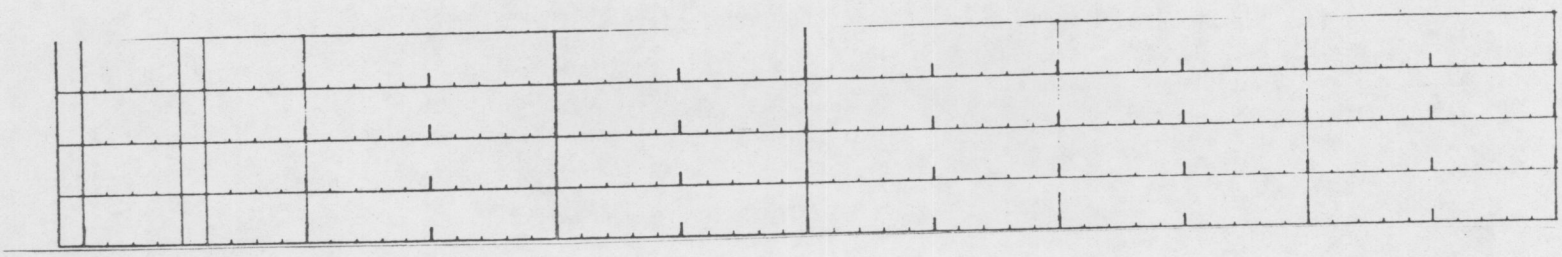
$$\frac{2X+3Y^2}{5Z}$$

_____

(4 pts) 20. Write the FORTRAN statements required to print

TOTAL EQUALS XXXX

on the first line on a new page, beginning in print position 10. (XXXX denotes the value of the variable ITØT that has been given a value in a previous part of the program.) There should be one space between the word EQUALS and the left-most position of ITØT.



21. Consider the array X with 10 elements shown below:

X(1) = 15.
X(2) = 4.
X(3) = 8.
X(4) = 14.
X(5) = 1.
X(6) = 13.
X(7) = 21.
X(8) = 9.
X(9) = 5.
X(10) = 3.

Provide the value of the indicated variables after each of the following program segments has been executed.

(2 pts) a)

```
I = 3
T = (7-I)
```

T = _____

(3 pts) b)

```
T=0
DO 20 I=1,10,3
20 T=T+X(I)
```

T=_____

I=_____

(3 pts) c)

```
K=1
DO 30 I=2,10
IF(X(K).GT.X(I))K=I
30 CONTINUE
```

K=_____

(20 pts) 22. Inventory records are maintained on Tape 11 with the following layout;

Position	Variable Name	Description
1-6	INUM	Item Number
7-29	(provide your own)	Item Name
30-33	BINV	Beginning Inventory level ($XXXX_{\wedge}$)
34-37	EINV	Ending Inventory level ($XXXX_{\wedge}$)

Assuming that the proper control cards have been prepared, write a complete FORTRAN program that will read this file and rewrite it onto Tape 12, omitting any records with no change in inventory level (where beginning inventory and ending inventory are the same). Be sure and terminate this program properly. (You may want to prepare a program flow chart before writing this program.)

23. We have ... student data cards with the following layout:

Card columns	Description of Field
1-7	Student Identification Number
8-30	Student Name
31-32	State Code (Ind = 23)
33-34	School Code (Business = 04)
41-43	Hours Completed
44-46	Quality Points Earned
47-48	Hours enrolled this semester

We wish to read these cards and print out a list of all out of state Business School students, giving name, hours completed, and GPA (quality points divided by hours completed).

After all the cards have been read, we wish to print out the average hours currently enrolled for all Business Students, and the average hours currently enrolled for all out of state business school students. The end of data card has a negative number in columns 1-7.

(20 pts) a). Prepare a detailed program flow chart for this program using the ANSI standard symbols.

(5 pts) b) Describe the test data cards that would be needed in order to debug this program.

(15 pts) 24. 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)
22-41	Description of the item.
42-45	Quantity sold
46-51	Dollar amount of the 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.

30. A local department store has a computerized record keeping system for its inventory and charge accounts. This system maintains an inventory file of records of the inventory of each item stocked and a customer account file of records of charges against each customer account. These files are on magnetic tape. The input to the system is a punched card that contains the following data:

Card columns	Description
1-7	Customer account number
8-13	Item number
14-16	Quantity sold
17-21	Dollar amount of sale (XXX$\wedge$XX)

(20 pts) Using ANSI standard flow chart symbols, devise a system flow chart for a system that uses the above cards to update both of these files, and produce both an inventory status report and a customer status report.