SCRAMBLE: Computer Preparation of Multiple Forms of an Examination

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1620 USERS GROUP PROGRAM REVIEW AND EVALUATION

Program No. _____ Date _____

Program Name: _____

1. Does the abstract adequately describe what the program is and what it does? Yes___ No___
   Comment _____

2. Does the program do what the abstract says? Yes___ No___
   Comment _____

3. Is the Description clear, understandable, and adequate? Yes___ No___
   Comment _____

4. Are the Operating Instructions understandable and in sufficient detail? Yes___ No___
   Comment _____
   Are the Sense Switch options adequately described (if applicable)? Yes___ No___
   Are the mnemonic labels identified or sufficiently understandable? Yes___ No___
   Comment _____

5. Does the source program compile satisfactorily (if applicable)? Yes___ No___
   Comment _____

6. Does the object program run satisfactorily? Yes___ No___
   Comment _____

7. Number of test cases run _____
   Are any restrictions as to data, size, range, etc. covered adequately in description? Yes___ No___
   Comment _____

8. Does the Program meet the minimal standards of the 1620 Users Group? Yes___ No___
   Comment _____

9. Please list any suggestions to improve the usefulness of the program. These will be passed on to the author for his consideration.
   Comment _____

Please return to:

Mr. Robert J. Robinson (PREP)
Marquette University
Computing Center
1515 W. Wisconsin Avenue
Milwaukee 3, Wisconsin

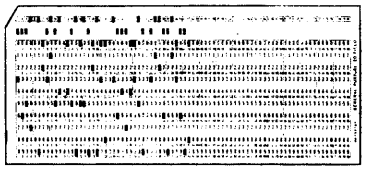
Your Name _____

Company _____

Address _____

User Group Code _____

THIS REVIEW FORM IS PART OF THE 1620 USER GROUP ORGANIZATION'S PROGRAM REVIEW AND EVALUATION PROCEDURE. NONMEMBERS ARE CORDIALLY INVITED TO PARTICIPATE IN THIS EVALUATION.



SCRAMBLE: Computer Preparation of Multiple Forms of an Examination

Harold Joseph Highland, Ph.D.
Director, Computer Laboratory
LONG ISLAND UNIVERSITY
Brooklyn 1, New York
1429

Modifications or revisions to this program, as they occur, will be announced in the appropriate Catalog of Programs for the IBM Data Processing Systems. If such announcement indicates a change to the program decks or tapes, a complete new program, if needed, should be requested from the Program Distribution Center.

DECK KEY

1. Scramble Source Deck
2. Scramble Compressed Object Deck w/subroutines
3. Sample Input Deck
4. Sample Output Deck

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1620 USERS GROUP LIBRARY
PROGRAM ABSTRACT

1. **TITLE (If subroutine, state in Title):** **SCRAMBLE**: Computer Preparation of Multiple Forms of an Examination

2. **Author; Organization:** Harold Joseph Highland, College of Business Administration, Long Island University

   Date: July 26, 1964 **Users Group Membership Code:** 1429

3. **Direct Inquiries to Name:** Dr. Harold Joseph Highland, Director of Computer Laboratory, Long Island University, Brooklyn 1, N.Y. **Phone:** 212-852-9100

4. **Description/Purpose: (5. Method; 6. Restriction/Range; When Applicable)**
   Program designed to meet needs of schools wherein large classes dictate need for multiple copies of the same examination. Program will produce these multiple copies by rearranging the sequence of the examination questions. Punched card output is used to produce (a) teacher's copy with answer key printed next to each question and (b) offset master stencil used for printing; both of these can be produced on a 407 or similar model printer. Program will handle up to 50 questions, each of which can be up to 99 cards long.

7. **Specifications (Check or fill in appropriate spaces):**
   a. **Storage used by program:** 19059 to 20000
   b. **Equipment required by program:**
      Card System ■ ; **Magnetic Tape System** ____ ; **No. of Tapes** ____ ;

      Paper Tape System ____ ; **Disk File System** ____ ; **No. of Packs** ____ ;

      TNS, TNF, MF ___ ; **Auto divide** ___ ; **Indirect addressing** ___ ; **Floating point hardware** ____ ;

      Other (specify) ____

      Can program be used on lesser Machine? see below **Specify which requirements can be easily removed** ☐ Can be used on a minium 1620 20K unit with card I/O ☐
   c. **Programming type (Check appropriate spaces):**

      Fortran without Format ____ ; **Fortran with Format** ■ ;

      Fortran II ___ ; **Mainline, Complete** ___ ; **Subroutine or function subprogram(S or F)** ____ ;

      Is the program a library (ie, SPS) function to the Fortran system checked? ____ ;

      SPS ____ ; **SPS - 1620/1710** ____ ;

      Mainline, Complete ____ ; **Macro** ____ ; **Subroutine** ____ ;

      Other programming language: ____ ; **Give details** ____
   d. **Language used in the writeup:** Fortran
8. **Additional Remarks:** Two modifications are possible: (a) new question numbers can be generated by a random number subroutine or program instead of the header cards, and (b) program can be easily altered to handle 100 or more – up to 999 – questions.

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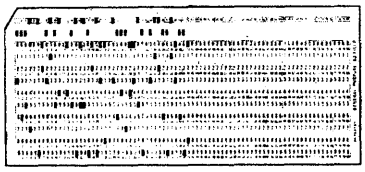
Dr. Harold Joseph Highland, Director



SCRAMBLE: Computer Preparation of Multiple Forms of an Examination

Dr. Harold Joseph Highland — Director, Computer Laboratory
Long Island University, Brooklyn 1, New York — 212 - 852 - 9100

Purpose

SCRAMBLE is designed to meet the requirements of schools wherein several forms of the same examination are required for testing purposes in the classroom or lecture halls. It is an educational tool, designed to:

- save secretarial time by eliminating clerical retyping of alternate forms or multiple forms of the same exam,
- produce multiple forms of examinations wherein the question sequence can be prepared by the generation of random numbers,
- prepare the multiple forms in card format usable to prepare offset masters or mimeograph stencils by using a 407 printer or any other 80/80 printer,
- simplify preparation of multiple answer keys since each new output deck contains the answer to each question in coded form (coded answers are not printed when preparing student copies of the examinations),
- permit the use of any card-prepared examination — multiple-choice, true-false, or other types of objective tests as well as essay form — with this program.

Compilation

Source program was processed with Fortran-with-Format Processor |F 2.0| and used with Fortran-with-Format Subroutines |F 3.0|.

Input

Input for this program consists of two parts: (a) the header cards which contain the new sequence of question numbers, and (b) the examination question cards which contain the actual questions, and in the case of objective type examinations, the choice of answers, as well as the coding required for the program.

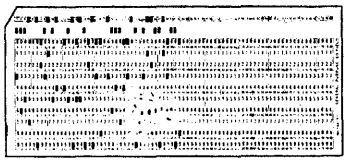
Preparation of Header Cards — It is necessary, at all times, to use a series of six (6) header cards, which preceed the actual question cards during the operation of this program. Any permutation from 1 through 50 may be used with this program. Should there be fewer than 50 questions on the examination, the new sequence of question numbers must be entered on the header cards in consecutive order with no blanks in the necessary format; the remainder of the format spaces are to be left unpunched.

The first five (5) header cards are prepared in a 9I3 format, with the new question numbers entered nine (9) to a card using three (3) columns for each question number, which is punched right justified. The sixth (6) header card is punched in a 5I3 format and the remainder of the columns on the card are left blank.

Thus, if there are only twenty-five (25) questions on an examination, the new sequence of question numbers are punched in the first three header cards with the last two positions on card three left blank. These punched header cards must be followed by three blank card when entering the header group before the actual question cards.

Various groups of header cards can be prepared in advance and kept on file for use with this program. These cards can be coded for convenient filing by using columns 60 through 80 for code identification on each card. The permutation of question numbers used for these header cards can be prepared by using a Table of Random Numbers or by generating a random number sequence with a random number program or using the "Random Number Subroutine for IBM 1620 Fortran W/Format," Library Program 7.0.021.

Preparation of Examination Cards — The original examination question cards are prepared using (a) a special format card for the first card of each question, and (b) a different format for the succeeding cards of each question.



II	J	K	Alphanumeric material in actual question	M	L

LAYOUT OF FIRST CARD OF EACH QUESTION

The first card of each question is prepared in the following format:

- Columns 1 – 3 II (Question number) in I3 format, right justified.
- Columns 4 – 6 J (Card number within the question series) in I3 format, right justified. Cards are numbered consecutively from 1 on within each question; the first card of each new question starts with 1.
- Columns 7 – 9 K (Question number) in I3 format, right justified; this number is printed along with the copy on the offset master stencil.
- Columns 10-75 Alphanumeric field reserved for actual examination question which is to be printed.
- Columns 76-77 M (Answer key in coded form) in I2 format, right

II	J	Alphanumeric material in actual question

LAYOUT OF SUCCEEDING CARDS OF EACH QUESTION

justified. In multiple-choice type question, for example, coding system is 1 indicates choice A, 2 indicates choice B, 3 = C, 4 = D, 5 = E. In a true-false type of examination, coding method used indicates a true answer by 1 and a false answer by 9.

- Columns 78-80 L (Number of cards per question) in I3 format, right justified. In preparing examination cards, this field is left blank until after all the cards for an individual question have been punched. The copy is then proofread and approved, after which the total number of cards plus 2, to provide for two spaces between questions, is punched in this position on the first card of each question.

The second and each succeeding card of each question are punched in the following format:

- Columns 1 - 3 II (Question number) in I3 format, right justified.
- Columns 4 - 6 J (Card number within the question series) in I3 format, right justified. Maximum number of cards that can be used within a single question is 99.
- Columns 10-75 Alphanumeric field reserved for actual examination question which is to be printed.

Operating Procedure

1. Clear computer core storage .... press RESET, RELEASE, and INSERT. Type 1600010 00000 and press RELEASE-START key. Then press INSTANT STOP and RESET.

2. Set PARITY and I/O switches to stop; set O'FLOW switch to program.

3. Fill punch hopper with blank cards.

4. Set condensed object deck into 1622 read hopper and press LOAD.

5. If standard object deck is used instead, make certain to enter the Fortran-with-Format subroutines.

6. Set the six (6) header cards followed by the examination question cards into the read hopper. If a condensed object deck has been loaded, press READER START on the 1622. If a standard object deck and subroutines have been used, press START on the console and READER START on the 1622.

7. When the PUNCH NO FEED light on the console goes on, press PUNCH START on the 1622.

8. After the last card has been read and punched, there will be a typeout: "Processing completed/enter new data/press start." At this point, return to step 3 of these instructions.

> Note: Console sense switches are not interrogated by the program. However, condensed deck was processed with a trace so that Sense Switch 4 <on> can be used, if a trace is desired.

Card Preparation and Examination Printout

To facilitate the punching of the header and question cards, three program cards for the card punch should be prepared in the format required.

The output must be sorted to arrange the cards in question number sequence. Sort output for columns 5 and 6 and then for columns 2 and 3.

When examination question cards have been proofed, prepare a printout on the 407 printer. Note spacing of questions on an 11-inch deep page or whatever size will be used for final printing of the examination. This copy should be kept on file since it contains the answer key. Code each form of an examination for easy matching of cards and printout key form.

To make printed copy of the examination, add necessary title and course cards, making certain that each question is self-contained on a page with no runover of questions between pages. Insert offset master stencil into printer. Remove pins controlling printing of columns 1 through 6 as well as the pins for columns 76 through 80. Only the material which appears in columns 7 through 75 should be printed on the master stencil. It is important to note this print area when preparing the necessary title

cards for the examination; that is, the cards noting course title and course number, provision for student's name, date, section number, etc. (See sample copy of test printout with output illustrations.)

Program Modification

Three modifications are possible with this program. Two involve the preparation of the new question numbers and the third affects the number of questions which the program can handle.

The program was written in its current form since we use mark-sense IBM cards for computer-scoring of objective examinations. There is space for only 50 answers on these cards, and, therefore, examinations are prepared in units of 50 questions as a maximum. When a teacher's examination calls for more than 50 questions (with a maximum of 150), a second and even a third set of 50 questions are processed by this program.

Since the mark-sense answer cards are printed from 1 through 50, we use color coding for examinations containing more than 50 questions, following the system indicated below:

- The first 50 questions are printed on white paper and are answered by the students on natural-color IBM mark-sense cards.
- Questions 51 through 100 are printed on yellow or buff paper and are answered on mark-sense cards with a yellow stripe across the 12-edge of the card.
- The remaining 50 questions, if the examination exceeds 100 questions, are printed on blue paper and are answered on mark-sense cards with a blue stripe across the 12-edge of the card.

An almost unlimited number of multiple forms of the same examination is possible with this program. [1] However, different schools might wish to use this program with the following modifications.

---

[1] The number of possible forms, permutations actually, is $_{50}P_{50} = 50!$ which is equal to 3.0414×10^{64} — more than enough to meet the requests of any teacher.

■ To increase program to handle more questions ■ The program can be modified to accomodate any number of questions beyond the 50 for which it is now designed and up to 999 questions, by (a) altering two of the format statements – 2 and 6 – (b) altering dimension statement 13, and (c) adding the appropriate number of additional "Read 3" statements.

- The dimension statement – 13 Dimension I(50) should be changed to place the total number of questions within the brackets.
- The two format statements should be altered to read as follows:

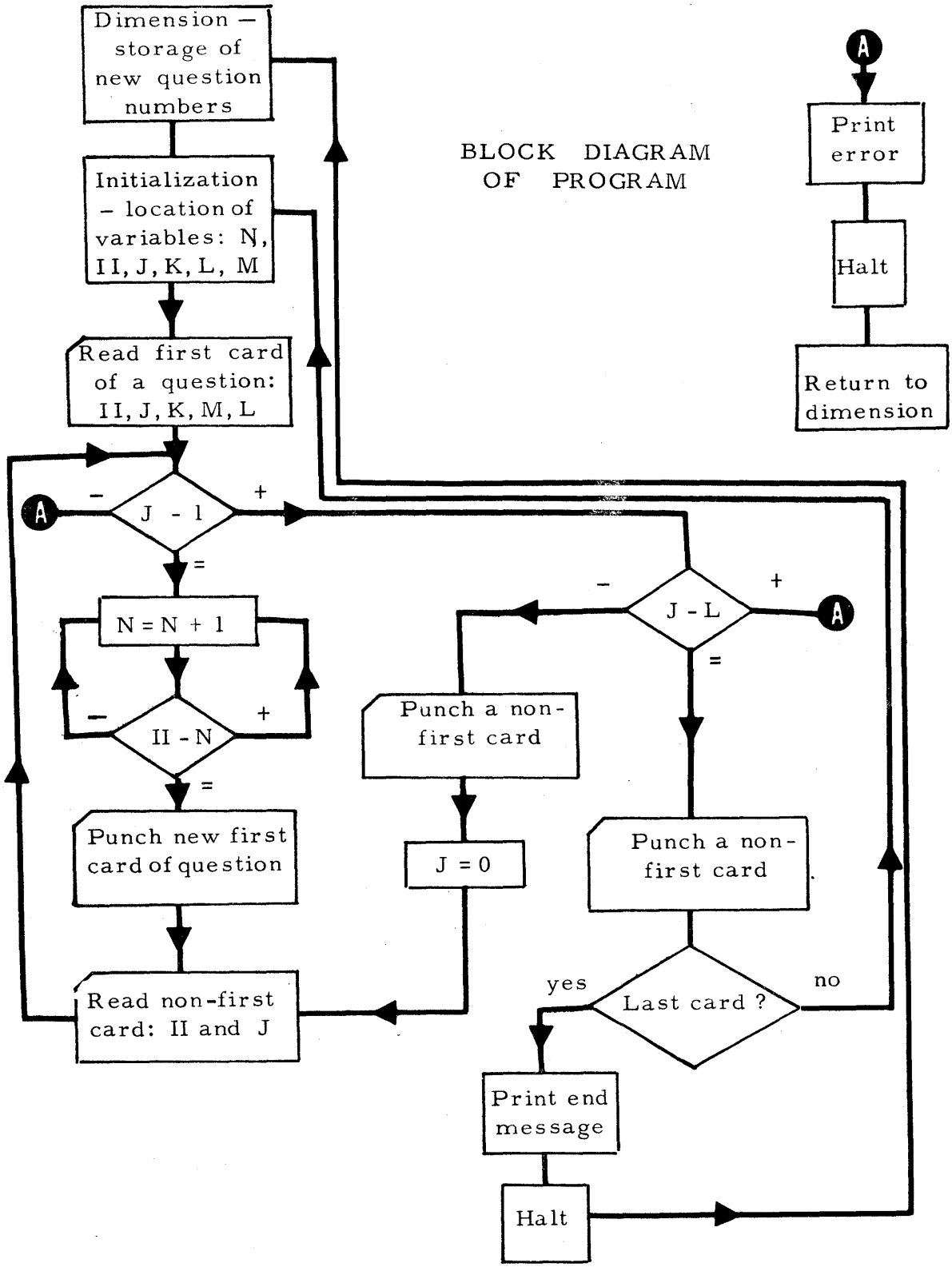
```
2 Format (I4,I3,I4,49X13XI2,I4)
6 Format (I4,I3,49X13X)
```

When examination cards are punched, the question copy now should be contained between columns 12 and 74, inclusive. When printing offset masters, it is necessary to surpress columns 1 through 7 and columns 75 through 80.

■ To use random number subroutine in place of header cards ■ A random number subroutine may be used to generate the new question numbers, thereby eliminating the need for the header cards and that portion of the program dealing with the related input instructions. It is necessary, however, to include a 'verification' program to make certain that the same number is not repeated when setting up the new question numbers.

■ To prepare header card series by using a special random number program ■ A lead program may be used to prepare the necessary header cards as part of this program. This program would generate random numbers according to any of the standard formulas and would verify the possible repeating of a number in the new question number sequence. The punched output of this program would then be entered in place of the header cards required for the SCRAMBLE program as it now exists.

BLOCK DIAGRAM
OF PROGRAM



SOURCE PROGRAM

```
C      SCRAMBLE -- MULTIPLE COPY EXAMINATION REVISION PROGRAM.
C      LIU/11/H.J.HIGHLAND          ¤EXAMINATION SERIES¤
C      MULTIPLE COPY EXAMINATION REVISION PROGRAM ¤REVISED JULY 1964¤.
C     ¤SORT OUTPUT FOR COLUMNS 5 AND 6 THEN 2 AND 3.
C      IN PRINTING OUTPUT FOR TEST REPRODUCTION, DO NOT PRINT COLUMNS 1-6
C      AND COLUMNS 76-80.
C     ¤SIX HEADER CARDS - USE BLANKS WHEN NECESSARY - PRECEED INPUT DATA.
C     ¤COLUMNS 2 AND 3 CONTAIN QUESTION NUMBER.¤COLUMN 1 RESERVED FOR
C      SIGN OF I3 FORMAT¤.
C     ¤COLUMNS 5 AND 6 ARE CARD NUMBER.  EACH QUESTION IS NUMBERED
C      INDEPENDENTLY.¤COLUMN 4 RESERVED FOR SIGN OF I3 FORMAT¤.
C     ¤COLUMNS 8 AND 9 ARE FOR QUESTION NUMBER, ON FIRST CARD ONLY, OF
C      EACH QUESTION.¤COLUMN 7 IS RESERVED FOR SIGN OF I3 FORMAT¤.
C     ¤COLUMNS 10-75 ARE HOLLERITH - ALPHIMERIC PUNCH FIELD.
C     ¤COLUMN 77 IS ANSWER KEY - USE NUMBER IN PLACE OF LETTER, A EQUALS
C      1,B 2,  C 3,  D 4,  E 5. ¤COLUMN 76 RESERVED FOR SIGN OF I2 FORMAT¤.
C     ¤COLUMNS 79 AND 80 INDICATE THE NUMBER OF CARDS CONTAINED IN EACH
C      QUESTION AND ARE PUNCHED IN THE FIRST CARD ONLY OF EACH QUESTION.
C      ¤COLUMN 78 IS RESERVED FOR SIGN OF I3 FORMAT¤  DO NOT PUNCH THESE
C      COLUMNS ON ANY BUT THE FIRST CARD OF EACH QUESTION. LEAVE THIS
C      PUNCH UNTIL ALL THE QUESTION CARDS FOR ANY SINGLE QUESTION HAVE
C      BEEN PUNCHED - THEN ENTER TOTAL ON THE FIRST CARD.
C      I          NEW QUESTION NUMBER.
C      II         EXISTING QUESTION NUMBER.
C      J          CARD NUMBER WITHIN QUESTION SERIES.
C      K          QUESTION NUMBER ON FIRST CARD ONLY.
C      L          NUMBER OF CARDS PER QUESTION.
C      M          ANSWER KEY
C      N          NEW QUESTION NUMBER CONTROL.
    2 FORMAT%I3,I3,I3,49X17XI2,I3¤
    3 FORMAT%9I3¤
    4 FORMAT%40HERROR IN CARD SEQUENCE/RESORT/START ANEW¤
    6 FORMAT%I3,I3,49X20X¤
    8 FORMAT%47HPROCESSING COMPLETED/ENTER NEW DATA/PRESS START¤
   13 DIMENSION I%50¤
      READ 3,I%1¤,I%2¤,I%3¤,I%4¤,I%5¤,I%6¤,I%7¤,I%8¤,I%9¤
      READ 3,I%10¤,I%11¤,I%12¤,I%13¤,I%14¤,I%15¤,I%16¤,I%17¤,I%18¤
      READ 3,I%19¤,I%20¤,I%21¤,I%22¤,I%23¤,I%24¤,I%25¤,I%26¤,I%27¤
      READ 3,I%28¤,I%29¤,I%30¤,I%31¤,I%32¤,I%33¤,I%34¤,I%35¤,I%36¤
      READ 3,I%37¤,I%38¤,I%39¤,I%40¤,I%41¤,I%42¤,I%43¤,I%44¤,I%45¤
      READ 3,I%46¤,I%47¤,I%48¤,I%49¤,I%50¤
   26 N#0
      II#0
      J#0
      K#0
      M#0
      L#0
      IF%SENSE SWITCH 9¤ 1,1
    1 READ 2,II,J,K,M,L
```

```
100 IF%J-1□ 5,7,11
  5 PRINT 4
    PAUSE
    GO TO 1
  7 N#N&1
    IF%II-N□ 7,99, 7
 99 PUNCH 2,I%N□,J,I%N□,M,L
  9 READ 6,II,J
    GO TO 100
 11 IF%J-L□ 23,17,15
 15 PRINT 4
    PAUSE
    GO TO 1
 17 PUNCH 6,I%N□,J
    IF%SENSE SWITCH 9□ 25,21
 21 GO TO 26
 23 PUNCH 6,I%N□,J
    J#0
    GO TO 9
 25 PRINT 8
    PAUSE
    GO TO 13
    END
```

SAMPLE INPUT DATA LIU 11

```
 4  2  5  1  3                                                    HEADER 1
                                                                  HEADER 2
                                                                  HEADER 3
                                                                  HEADER 4
                                                                  HEADER 5
                                                                  HEADER 6
 1  1  1 A MANUFACTURING PROCESS TURNS OUT A PRODUCT THAT IS 10% DEFECTIVE  4  5
 1  2   THE PROBABILITY THAT 5 ITEMS DRAWN FROM ASSEMBLY LINE WILL CONTAIN
 1  3   NO DEFECTIVES IS     A¤ .20   B¤ .31   C¤ .50   D¤ .59   E¤ .63
 1  4
 1  5
 2  1  2 THE NUMBER OF COMBINATIONS OF 5 ITEMS THAT CAN BE MADE FROM A      3  4
 2  2   TOTAL OF 10 ITEMS IS     A¤ 51   B¤ 170   C¤ 252   D¤ 509   E¤ 675
 2  3
 2  4
 3  1  3 WHAT IS THE LARGEST POSSIBLE SAMPLE SIZE THAT WOULD BE REQUIRED    4  7
 3  2   IN ORDER TO BE 99.73 PERCENT CORRECT THAT THE ESTIMATE OF A  UNI-
 3  3   VERSE PERCENTAGE BY THE USE OF A SAMPLE WILL NOT BE IN ERROR BY
 3  4   MORE THAN PLUS OR MINUS 30       A¤ 1,000   B¤ 1,500   C¤ 2,000
 3  5   D¤ 2,500   E¤ 3,000
 3  6
 3  7
 4  1  4 A SAMPLE OF 1,000 GIVES A CERTAIN DEGREE OF PRECISION IN ESTI-     3  8
 4  2   MATING THE MEAN OF THE UNIVERSE FOR A UNIVERSE OF 1.000,000.
 4  3   WHAT SIZE SAMPLE WOULD BE NEEDED TO GIVE THE SAME PRECISION FOR A
 4  4   SECOND UNIVERSE THAT HAD THE SAME CHARACTERISTICS AS THE FIRST,
 4  5   EXCEPT THAT ITS SIZE WAS EQUAL TO 100,000,000      A¤ 10   B¤ 100
 4  6   C¤ 1,000   D¤ 10,000   E¤ 100,000
 4  7
 4  8
 5  1  5 INCREASING THE SIZE OF A SAMPLE FOURFOLD WOULD REDUCE THE ERROR    2  5
 5  2   DUE TO SAMPLING      A¤ 25%   B¤ 50%   C¤ 75%   D¤ 99.99%   E¤ NOT
 5  3   AT ALL
 5  4
 5  5
```

LONG ISLAND UNIVERSITY
COLLEGE OF BUSINESS ADMINISTRATION <12>

BA 128 BUSINESS STATISTICS

NAME _____ CLASS _____

1 A MANUFACTURING PROCESS TURNS OUT A PRODUCT THAT IS 10% DEFECTIVE THE PROBABILITY THAT 5 ITEMS DRAWN FROM ASSEMBLY LINE WILL CONTAIN NO DEFECTIVES IS A□ .20 B□ .31 C□ .50 D□ .59 E□ .63

2 THE NUMBER OF COMBINATIONS OF 5 ITEMS THAT CAN BE MADE FROM A TOTAL OF 10 ITEMS IS A□ 51 B□ 170 C□ 252 D□ 509 E□ 675

3 WHAT IS THE LARGEST POSSIBLE SAMPLE SIZE THAT WOULD BE REQUIRED IN ORDER TO BE 99.73 PERCENT CORRECT THAT THE ESTIMATE OF A UNIVERSE PERCENTAGE BY THE USE OF A SAMPLE WILL NOT BE IN ERROR BY MORE THAN PLUS OR MINUS 30 A□ 1,000 B□ 1,500 C□ 2,000 D□ 2,500 E□ 3,000

4 A SAMPLE OF 1,000 GIVES A CERTAIN DEGREE OF PRECISION IN ESTIMATING THE MEAN OF THE UNIVERSE FOR A UNIVERSE OF 1,000,000. WHAT SIZE SAMPLE WOULD BE NEEDED TO GIVE THE SAME PRECISION FOR A SECOND UNIVERSE THAT HAD THE SAME CHARACTERISTICS AS THE FIRST, EXCEPT THAT ITS SIZE WAS EQUAL TO 100,000,000 A□ 10 B□ 100 C□ 1,000 D□ 10,000 E□ 100,000

5 INCREASING THE SIZE OF A SAMPLE FOURFOLD WOULD REDUCE THE ERROR DUE TO SAMPLING A□ 25% B□ 50% C□ 75% D□ 99.99% E□ NOT AT ALL

❑ **Sample of printout for examination, similar to that which would appear on the offset master used for reproducing the copy. Note that code data are surpressed and that special title cards are used.**

SAMPLE OUTPUT LIU 11

```
1  1  1 A SAMPLE OF 1,000 GIVES A CERTAIN DEGREE OF PRECISION IN ESTI-     3  8
1  2   MATING THE MEAN OF THE UNIVERSE FOR A UNIVERSE OF 1.000,000.
1  3   WHAT SIZE SAMPLE WOULD BE NEEDED TO GIVE THE SAME PRECISION FOR A
1  4   SECOND UNIVERSE THAT HAD THE SAME CHARACTERISTICS AS THE FIRST,
1  5   EXCEPT THAT ITS SIZE WAS EQUAL TO 100,000,000      A□ 10    B□ 100
1  6   C□ 1,000    D□ 10,000    E□ 100,000
1  7
1  8
2  1  2 THE NUMBER OF COMBINATIONS OF 5 ITEMS THAT CAN BE MADE FROM A      3  4
2  2   TOTAL OF 10 ITEMS IS     A□ 51   B□ 170   C□ 252   D□ 509   E□ 675
2  3
2  4
3  1  3 INCREASING THE SIZE OF A SAMPLE FOURFOLD WOULD REDUCE THE ERROR    2  5
3  2   DUE TO SAMPLING      A□ 25%    B□ 50%    C□ 75%    D□ 99.99%    E□ NOT
3  3   AT ALL
3  4
3  5
4  1  4 A MANUFACTURING PROCESS TURNS OUT A PRODUCT THAT IS 10% DEFECTIVE 4  5
4  2   THE PROBABILITY THAT 5 ITEMS DRAWN FROM ASSEMBLY LINE WILL CONTAIN
4  3   NO DEFECTIVES IS     A□ .20    B□ .31    C□ .50    D□ .59    E□ .63
4  4
4  5
5  1  5 WHAT IS THE LARGEST POSSIBLE SAMPLE SIZE THAT WOULD BE REQUIRED    4  7
5  2   IN ORDER TO BE 99.73 PERCENT CORRECT THAT THE ESTIMATE OF A  UNI-
5  3   VERSE PERCENTAGE BY THE USE OF A SAMPLE WILL NOT BE IN ERROR BY
5  4   MORE THAN PLUS OR MINUS 30       A□ 1,000    B□ 1,500    C□ 2,000
5  5   D□ 2,500    E□ 3,000
5  6
5  7
```

❒ Output has already been sorted for columns 5 and 6 and then columns 2 and 3 to arrange questions in sequence order of question numbers.

LONG ISLAND UNIVERSITY
COLLEGE OF BUSINESS ADMINISTRATION <14>

BA 128 BUSINESS STATISTICS

NAME _____ CLASS _____

1 A SAMPLE OF 1,000 GIVES A CERTAIN DEGREE OF PRECISION IN ESTIMATING THE MEAN OF THE UNIVERSE FOR A UNIVERSE OF 1.000,000. WHAT SIZE SAMPLE WOULD BE NEEDED TO GIVE THE SAME PRECISION FOR A SECOND UNIVERSE THAT HAD THE SAME CHARACTERISTICS AS THE FIRST, EXCEPT THAT ITS SIZE WAS EQUAL TO 100,000,000 A□ 10 B□ 100 C□ 1,000 D□ 10,000 E□ 100,000

2 THE NUMBER OF COMBINATIONS OF 5 ITEMS THAT CAN BE MADE FROM A TOTAL OF 10 ITEMS IS A□ 51 B□ 170 C□ 252 D□ 509 E□ 675

3 INCREASING THE SIZE OF A SAMPLE FOURFOLD WOULD REDUCE THE ERROR DUE TO SAMPLING A□ 25% B□ 50% C□ 75% D□ 99.99% E□ NOT AT ALL

4 A MANUFACTURING PROCESS TURNS OUT A PRODUCT THAT IS 10% DEFECTIVE THE PROBABILITY THAT 5 ITEMS DRAWN FROM ASSEMBLY LINE WILL CONTAIN NO DEFECTIVES IS A□ .20 B□ .31 C□ .50 D□ .59 E□ .63

5 WHAT IS THE LARGEST POSSIBLE SAMPLE SIZE THAT WOULD BE REQUIRED IN ORDER TO BE 99.73 PERCENT CORRECT THAT THE ESTIMATE OF A UNIVERSE PERCENTAGE BY THE USE OF A SAMPLE WILL NOT BE IN ERROR BY MORE THAN PLUS OR MINUS 30 A□ 1,000 B□ 1,500 C□ 2,000 D□ 2,500 E□ 3,000

❑ **Sample printout of an alternate form of the examination. See page 12 for original question sequence.**

SYMBOL TABLE -- LIU 11

19999	SIN	19769	1 19279
19989	SINF	19269	0026
19979	COS	19259	N
19969	COSF	19249	0000
19959	ATAN	19239	II
19949	ATANF	19229	J
19939	EXP	19219	K
19929	EXPF	19209	M
19919	LOG	19199	L
19909	LOGF	19189	0001
19899	SQRT	19179	0100
19889	SQRTF	19169	0001
19879	0002	19159	000
19869	0002	19149	0005
19859	0003	19139	0007
19849	0003	19129	0011
19839	0004	19119	0099
19829	0004	19109	0009
19819	0006	19099	0023
19809	0006	19089	0017
19799	0008	19079	0015
19789	0008	19069	0025
19779	0013	19059	0021

□NOTE□ ALL HIGH ORDER DIGITS ARE FLAGED.