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ABSTRACT

This paper describes a process used to assess the technical competency of non-direct line candidates for managerial positions in computer specialties. The Training and Experience (T&E) qualifying test, a multi-method approach combining task-based, computer scorable evaluations of training and experience with multiple-choice batteries, was used as a qualifying screen for determining candidates' knowledge, training, and experience in specific competency areas. An assessment matrix was used to evaluate candidate scores from the multi-methods and identify candidates in need of follow-up. The process was content valid, efficient (the number of candidates across all competencies equals 1200), and acceptable to candidates and subject matter experts. Tables illustrate the matrix and evaluation results. The job experience and training questionnaire and an answer sheet are attached. (Contains 17 tables.) (Author/SLD)

THE ASSESSMENT MATRIX

A T&E and M/C Qualifying Test For Managers of Data Processing

Background and Tables Prepared for the
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Abstract

This session will describe a process used to assess the technical competency of non-direct line candidates for managerial positions in computer specialties. A multi-method approach, combining task-based, computer scorable evaluations of training and experience with multiple-choice batteries, was used as a qualifying screen for determining candidates' knowledge, training, and experience in specific competency areas. An assessment matrix was used to evaluate candidate scores from the multi-methods and identify candidates in need of follow-up. The process was content valid, efficient (N of candidates across all competencies equals 1200) and acceptable to candidates and subject matter experts.

Background

There are six titles involved in this promotion series to second level supervisory positions where the principal responsibility is the management of a technical EDP operation. The generic title is Manager of Data Processing Services. All individuals in first-line supervisory computer positions qualified for the generic title. The series also included one generic/technical title and four technical parenthetics. Direct-line candidates in lower level technical titles are "A-list" eligibles for the corresponding technical Manager titles; a qualifying screen was developed to determine "B-list" eligibility for these technical specialties.[1] Candidates who qualified for any of the technical parenthetic titles also qualified for the generic/technical title. Table One illustrates the organizational relationship between a sample of these titles. The computer administered simulation test was the sole ranking portion for all titles in this series.

Examinations for these titles were last held in 1984-85. That selection plan consisted of an oral only, and only direct-line promotions were allowed. Although the need to hold examinations for these titles had been apparent for some time, because of financial and staff constraints, the Department lacked the resources to conduct oral examinations for this large of a candidate competition. After considerable negotiation, the Testing Services Division agreed to develop a simulation examination, which was to be administered via computer.

Extensive consultations with the Interdepartmental Committee on Electronic Data Processing (ICEDP) and the New York State Forum on Information Resource Management (NYSFIRM) revealed that these organizations wanted to increase the ability of candidates to qualify for more than one title. For example, they felt that there may be some individuals who, " . . . are in an Associate Data Communications title who could perform the duties of the Manager of Data Base." Concomitantly, they insisted that B-list eligibles need to have demonstrated competency in the technical specialty.

[1] Simply put, A-List eligibles are those individuals who qualify for the examination because they serve in the same title at the next lower level. For example, an Associate Computer Programmer (Data Base) in an A-List eligible for the Manager of Data Processing (Data Base). He/she would be a B-List eligible for Manager of Data Processing (Data Communications) positions. "A-list eligibles have preference over B-list eligibles.

The Assessment Matrix

In response to this mandate, the Testing Service Division developed the "matrix" approach to evaluating competency in each technical specialty. The premise behind this model was to provide a qualifying screen which would allow candidates to demonstrate their competency in each technical area utilizing multiple assessment devices. The matrix consisted of two principal components--a multiple-choice battery and a rating of the candidates' training and experience. Each component focused directly on the technical area. Table Two provides a generic example of the Assessment Matrix. The testing measure used is displayed in the rows, the competency score in the columns, and standards established for obtaining that score in the cells. As can be seen, each cell is scored as a 0, 1 or 2 depending upon the competency level demonstrated. The sum of the cell scores (this is a full compensatory model) is the candidate's competency score.[2] For each title, the multiple-choice components comprised half of the weight of the matrix; the assessment of training and experience was equally weighted with the multiple-choice assessments. In general, a score of four represents "minimal competence demonstrated."

The Multiple-Choice Component - Standards and Scoring

The multiple-choice contributions to the matrix are straightforward. A test battery for the Associate level generic and technical titles was administered in April 1993. The test for each title included two multiple-choice subtests of 15 items each assessing applied knowledge in each technical specialty. To be considered as B-list eligibles for a Manager title candidates were required to take the specialty-specific multiple-choice material.

After consultation with ICEDP and NYSFIRM it was decided that below average scores (less than the mean) were not an adequate demonstration of minimal competence and would be assigned a matrix cell score of 0 points. Scores at, or higher than the mean, but less than one standard deviation above the mean, equated with minimal competence and would be assigned a matrix cell score of one point. Scores one standard deviation above the mean, or higher, are indicative of exceptional competence in the specialty area and would be assigned a matrix cell score of 2 points. These standards were uniformly applied for each subtest in each specialty area for each title. Tables Three A and Three B show frequency distribution data for each of the subtests. Tables Four A and Four B provide assessment matrix score data for candidate performance on the multiple-choice components.[3] NOTE: Fifty Seven candidates completed the E&T Questionnaire but did not take the corresponding multiple choice subtest. The multiple choice tables record these candidates as missing. They are included in the data analysis for the E&T component.

Training and Experience Component - Design and Scoring

The assessment of the Experience and Training (E&T) portion of the candidates' competencies was more complex. The operational objective was to develop a machine readable (opscannable) questionnaire (N of ratings $\simeq$ 1200) which would provide the data upon which E&T competency decisions would be based. Using the job analysis information and working with

[2] Conceptually, the Assessment Matrix could be extended along each vector. Additional assessment devices could be added; less aggregate values than 0, 1 or 2 could be assigned; each cell could be weighted in proportion to the criticality of successful performance in the job.

[3] Tables Three through Ten used the data obtained from the Manager of Data Processing (Data Base) as an example. Similar results were obtained and decisions were made for each of the titles evaluated.

committees of subject matter experts in each specialty area, Testing Division staff determined those 20 critical tasks which uniquely defined competence in the technical specialty. For example, although "writes computer programs in COBAL" might be a critical task for the data base title, this task is not unique to successful performance in the data base specialty. On the other hand, "Defines data elements for new data base systems and/or normalizes data elements" is a critical task done only in data base environments. Experience in the latter task would be rated; the former task would be excluded from the analysis.

Next, a questionnaire was prepared which asked for information about the candidates' experience in performing each task in four dimensions. First, has the respondent performed the task since April of 1991?[4] Second, how often had the respondent performed this task (indicated on a frequency scale of 1 through 15+)? Third, how competent is the respondent in performing the task (provided by a self-rated competence scale ranging from not familiar to master)? Finally, candidates were required to provide the names of individuals who could verify the respondent's answers to the first three questions. A sample of the questionnaire and the opscannable form are attached.

The combination of the data and the derivation of the matrix cell scores for the experience portion was straightforward. A task competency score (0 or 1) was derived for each candidate for each task.

Candidates were assigned a task competency score of **0** if:

(1) They had not performed the task since April 17, 1991; **or**
(2) They performed the task, but did so less than three times[5] (frequency equals 0, 1 or 2); **or,**
(3) They indicated that they were either not familiar with the task or would need guidance in performing the task (competency level equals 1 or 2).

Candidates were assigned a task score of **1** if:

(1) They performed the task since April 1991; **and,**
(2) They performed the task 3 or more times (frequency ≥ 3); **and,**
(3) They indicated that they could perform the task independently or were a master at performing the task (competency level equals 3 or 4); **and,**
(4) They provided the names of individuals who could verify their frequency and competence in the performance of the task.

Table Five A, B, and C provide data which illustrate candidate responses to task Four. Table Six provides a crosstabulation of the frequency by competency scores. Table Seven shows the summary results of this data reduction.

[4]The April 1991 date was selected by the ICEDP and subject matter expert committees as the cutoff date for relevant experience. Their evaluation was that, because of the rapidly changing technology involved with each of these specialties, the quality of experience greater than 2 1/2 years old may very likely be outmoded.

[5]This standard was based on the premise that performance of the task two or fewer times since April 1991 meant it was performed, on average, less than once a year.

The sum of these task competency scores yielded, for each candidate, the number of tasks he/she could competently perform--the component competency score. This component competency score ranged from 0 (competent in no tasks) to 20 (competent in every task).

In consultation with ICEDP, NYSFIRM and subject matter experts, it was decided that any candidate who was competent in fewer than half of the tasks (component competency score ≤ 9) did not demonstrate minimal competence in the technical specialty and would be assigned a matrix cell score of 0. Candidates who could competently perform one half or more but fewer than three quarters of the tasks (component competency score $\geq 10 < 15$) were assigned the matrix cell score of 1. Any candidate who was competent in three quarters or more of the tasks (≥ 15) was assigned a matrix cell score of 2. These standards were applied to the experience ratings of all candidates for all titles.

Table Eight displays the frequency distribution of the component competency scores and the corresponding matrix score.

The training component of the matrix was developed using a more traditional approach. Table Two illustrates how the points were assigned to candidates in this portion of the matrix. Candidates achieved scores of 0, 1 or 2 based upon their combinations of relevant experience. These standards were developed in consultation with the SME groups. As with the other components in the matrix, with minor differences, the same standards were applied across all four of the technical titles of interest.

Tables Nine A and B provide a summary of the experience and training matrix score by component. As can be seen, each component contributed to assessing the competency of interest. In the general model, a matrix score of four or higher was the standard set for qualifying for the technical examination. The basis for this standard was that if a candidate demonstrated minimal competence in each of the four assessment devices he or she would have a matrix score of four. However, as indicated earlier, the matrix is a full compensatory model--a less than minimal score on one dimension could be offset by an exceptional score in another.

Tables Ten A and Ten B provide summary matrix score data for the Data Base Manager candidates.

Differences By Examination

The assessment matrices for the Manager of Data Processing and the Manager of Data Communications were both straightforward in content and design. The qualifying matrix for each of these qualifying examinations contained two-15 item multiple-choice components, and the ratings experience and training. The obtainable scores ranged from 0 to 8; a score of four or higher was considered qualifying. The matrix for the Manager System Programmer title contained three multiple-choice subtests in addition to the E&T ratings; therefore, in order to equally weight the multiple-choice versus E&T component, each multiple-choice matrix score was multiplied by two and each E&T score by three to yield a total possible matrix score of 24; the standard for minimum competence set at 12. Similarly, the Operations Manager examination contained four multiple-choice subtests. To equate the E&T and multiple-choice portions we multiplied each E&T cell score by two; therefore, the obtainable scores ranged from 0 to 16 and the minimum qualifying score was set at 8.

Tables Eleven, Twelve and Thirteen (A and B) provide summary data comparable to the Manager of the Data Base title.

Results and Standards

Tables Ten A through Thirteen A display the results of the Assessment Matrix by the number of candidates within each cell. There is a high degree of consistency in the proportion of candidates within corresponding cells. A marginally greater proportion of candidates performed better on the multiple-choice than the E&T components. Given the known reliability of the multiple-choice tests this is satisfactory.

A review of Tables Ten B through Thirteen B shows that the percentage of B-list eligibles passing this qualifying screen ranges from 20% to 26% of the eligibles. Further, approximately 40 to 50% of these individuals will not pass the simulation examination; hence, the number of eligibles on the B-lists is anticipated to be very small. As indicated earlier, the subject matter experts representing the ICEDP and the NYSFIRM were unequivocal in the position that it was critical that any B-list eligible be competent in the technical specialty. Therefore, it was essential that standards be kept high. Also, the selection ratio for these positions is extremely low; recruitment estimates indicate that, over the course of the next four years, only 4 or 5 appointments will be made to each of the four technical parenthetic positions. ICEDP predicts that the number of appointments made of B-list eligibles will be few or none.

Verification of the Candidate Responses

Table Fourteen displays the cross-tabulations of matrix scores by component. Inconsistency in candidate responses targeted selected individuals for further verification. First, any candidate with a matrix score less than 4 was excluded from further investigation. Candidates who achieved high multiple choice scores ($X \geq 3$), and correspondingly high E&T scores, ($X \geq 2$) were also excluded from further review. Verifiers were contacted for each candidate who qualified primarily based upon their score on the E & T (N=30).

Psychometric Analysis

The testing components used in assessing the candidates' technical qualifications for "B-list" eligibility formed the basis for their eligibility to be scored on the ranking portion of the examination. All candidates qualified as "A-list" eligibles for at least one Data Processing Manager title. A job simulation examination consisting of two interactive problems was administered--via computer--to approximately eleven hundred candidates. The first problem centered on the supervisory and management skills necessary for successful performance in managing an EDP operation; the second problem centered on the candidates' ability to manage a complex EDP project. Each problem focused on the candidates' problem-solving, decision-making, information-gathering and interpersonal skills.

Although the multiple-choice, experience and training distributions were evaluated dichotomously for the purposes of the matrix, the underlying distributions of the first two components, and to a lesser extent, the training component, were continuous and could, conceivably, be used as ranking mechanisms. Tables Fifteen A and B provide task competency score descriptive data (means, standard deviations, number of cases and reliability estimates) for the experience component. Since Table Fifteen A includes those candidates who did not perform a particular task, the reliability estimate may be spuriously high. Table Fifteen B excludes those candidates from the analysis. An examination of the data shows considerable variability in the task score item means and high reliability in the scoring mechanism. Indeed, although difficult, the distribution statistics are very similar to those obtained using multiple-choice tests.

Table Sixteen presents the intercorrelation matrix among the variables in the assessment system. Most of the correlations are zero order; however, the significant correlations are as expected. The multiple-choice subtests are highly inter-correlated. Since the number of training courses (Crednum) and number of training hours reflect clustered rather than continuous distributions, their correlations with the other components are predictably low. The simulation problems (Sim 1 and Sim 2) correlate higher with each other than with the other variables--again, as anticipated, since they were designed to evaluate managerial, rather than technical, skills.

Table Seventeen presents a Principal Components Factor Analysis with Varimax rotation for the seven variables. A two-factor solution, accounting for forty-four percent of the variance, was derived. The loading of the components on these two factors can reasonably be described as indicative of a technical dimension and a managerial dimension.

Acknowledgments

The efforts of staff members of the Testing Services Division should be acknowledged for their contributions. Joan Robinson, Associate Personnel Examiner, and Ed Redelberger, Senior Personnel Examiner, conducted the job analysis on which the test plan was based. They also developed the multiple choice and simulation portions of the exams. Dr. Wendy Steinberg, Associate Personnel Examiner, developed the T&E portion of the exams. She also developed the scannable questionnaire and its directions.

Table One A

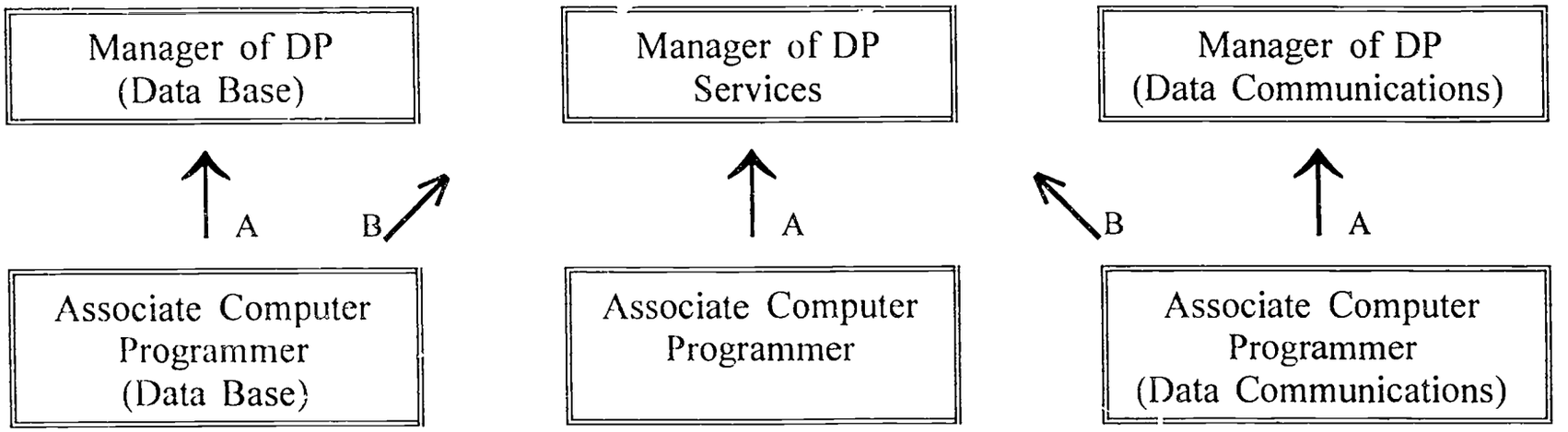

Table One B

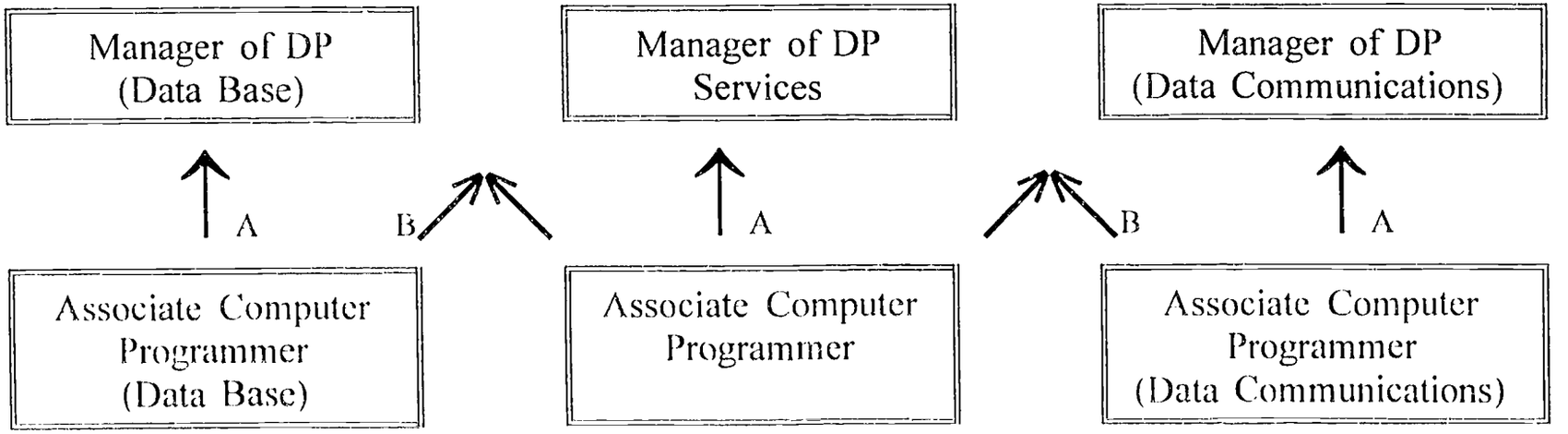

TABLE TWO
GENERIC MATRIX

	COMPETENCY DEMONSTRATED		
	0	1	2
MC1	Below Associate Mean Score	Mean to One Standard Deviation	One Standard Deviation or More Above Mean
MC2	Below Associate Mean Score	Mean to One Standard Deviation	One Standard Deviation or More Above Mean
EXPERIENCE	Competent in Fewer Than Ten Tasks	Competent in More Than 1/2 But Less Than 3/4 of Tasks	Competent in 3/4 or More of Tasks
TRAINING	Anything Less Than Shown in 1	6 College Credits **or** 24 Hours Training **or** 3 Credits + 12 Hours Training	6 Credits + 24 hours **or** 48 Hours **or** 3 Credits + 36 Hours **or** 12 Credits

TABLE THREE A
MULTIPLE CHOICE SUBTEST ONE
DATA BASE MANAGER

Matrix Score	Subtest Score	Frequency	Percent
0	3	2	.5
	4	10	2.6
	5	21	5.5
	6	33	8.7
	7	43	11.3
	8	57	15.0
1	9	48	12.7
	10	52	13.7
2	11	33	8.7
	12	14	3.7
	13	6	1.6
	14	2	.5
	15	1	.3
	.	57	15.0
	TOTAL	379	100.0

Mean = 8.416
Std Dev = 2.209

TABLE THREE B
MULTIPLE CHOICE SUBTEST TWO
DATA BASE MANAGER

Matrix Score	Subtest Score	Frequency	Percent
0	2	4	1.1
	3	9	2.4
	4	33	8.7
	5	32	8.4
	6	50	13.2
	7	57	15.0
1	8	45	11.9
	9	34	9.0
2	10	27	7.1
	11	17	4.5
	12	8	2.1
	13	3	.8
	14	3	.8
	.	57	15.0
	TOTAL	379	100.0

Mean = 7.224
Std Dev = 2.403

TABLE FOUR A
MATRIX SCORE
MULTIPLE CHOICE SUBTEST ONE
DATA BASE MANAGER

Matrix Score	Frequency	Percent
0	166	43.8
1	100	26.4
2	56	14.8
.	57	15.0
TOTAL	379	100.0

Mean = .658
Std Dev = .758

TABLE FOUR B
MATRIX SCORE
MULTIPLE CHOICE SUBTEST TWO
DATA BASE MANAGER

Matrix Score	Frequency	Percent
0	185	48.8
1	79	20.9
2	58	15.3
.	57	15.0
TOTAL	379	100.0

Mean = .606
Std Dev = .775

TABLE FIVE A
DO/DO NOT PERFORM TASK 04
DATA BASE MANAGER

	Value	Frequency	Percent
DO NOT PERFORM	0	179	47.2
DO PERFORM	1	200	52.8
	TOTAL	379	100.0

TABLE FIVE B
FREQUENCY OF PERFORMANCE TASK 04
DATA BASE MANAGER

Frequency	No. of Respondents	Percent
0	179	47.2
1	18	4.7
2	34	9.0
3	26	6.9
4	16	4.2
5	25	6.6
6	10	2.6
7	2	.5
8	4	1.1
10	15	4.0
12	3	.8
13	2	.5
15	45	11.9

TABLE FIVE C
COMPETENCY LEVEL - TASK 04
DATA BASE MANAGER

Competency	Value	No. of Respondants	Percent
NOT PERFORM	0	179	47.2
NOT FAMILIAR	1	3	.8
NEED GUIDANCE	2	32	8.4
INDEPENDENTLY	3	122	32.2
MASTER	4	43	11.3
	TOTAL	379	100.0

TABLE SIX
FREQUENCY OF PERFORMANCE BY COMPETENCY - TASK 04
DATA BASE MANAGERS

FREQUENCY	NOT PERFORM	NOT FAM	NEED GUIDE	INDEPENDENT	MASTER	TOTAL
0	178			1		179
1		1	7	9	1	18
2		1	9	21	3	34
3		1	6	17	2	26
4			3	10	3	16
5	1		3	17	4	25
6			2	5	3	10
7				2		2
8				3	1	4
10			1	14		15
12			1	1	1	3
13				1	1	2
15				21	24	45
TOTAL %	179 47.2	3 8	32 8.4	122 32.2	43 11.3	379 100.0

TABLE SEVEN
TASK 04 COMPETENCY SCORE
DATA BASE MANAGER

Task Score	Frequency	Percent
0	249	65.7
1	130	34.3
TOTAL	379	100.0

Mean = .343
Std Dev = .475

TABLE EIGHT
TASK COMPETENCY SCORES
FREQUENCY AND COMPETENCE ACROSS 20 TASKS
DATA BASE MANAGER

Matrix Score	Task Competency Score	Frequency	Percent
0	0	153	40.4
	1	23	6.1
	2	22	5.8
	3	17	4.5
	4	15	4.0
	5	12	3.2
	6	11	2.9
	7	16	4.2
	8	15	4.0
	9	8	2.1
1	10	10	2.6
	11	8	2.1
	12	9	2.4
	13	9	2.4
	14	8	2.1
2	15	6	1.6
	16	9	2.4
	17	5	1.3
	18	4	1.1
	19	8	2.1
	20	11	2.9
	TOTAL	379	100.0

TABLE NINE A
EXPERIENCE
DATA BASE MANAGER

Matrix Score	Frequency	Percent
0	292	77.0
1	44	11.6
2	43	11.3
TOTAL	379	100.0

Mean = .343
Std Dev = .673

TABLE NINE B
TRAINING
DATA BASE MANAGER

Matrix Score	Frequency	Percent
0	260	68.6
1	66	17.4
2	53	14.0
TOTAL	379	100.0

Mean = .454
Std Dev = .727

TABLE TEN A
NUMBER OF CANDIDATES IN EACH MATRIX CELL
DATA BASE MANAGER

	COMPETENCY DEMONSTRATED		
	0	1	2
MC1	166	100	56
MC2	185	79	58
EXPERIENCE	292	44	43
TRAINING	260	66	53

TABLE TEN B
DISTRIBUTION OF MATRIX SCORES
DATA BASE MANAGER

SCORE	FREQUENCY	CUM FREQ	%
8	1	1	.3
7	5	6	1.6
6	13	19	4.0
5	16	35	5.0
4*	28	63	8.7
3	52	115	16.1
2	61	176	18.9
1	64	240	19.9
0	82	322	25.5

Note: Excludes Candidates Who Did Not Participate in All Components

*Qualifying Score

TABLE ELEVEN A
NUMBER OF CANDIDATES IN EACH MATRIX CELL
DATA COMMUNICATIONS MANAGER

	COMPETENCY DEMONSTRATED		
	0	1	2
MC1	119	112	49
MC2	130	99	51
EXPERIENCE	273	29	34
TRAINING	279	28	29

TABLE ELEVEN B
DISTRIBUTION OF MATRIX SCORES
DATA COMMUNICATIONS MANAGER

SCORE	FREQUENCY	CUM FREQ	%
8	1	1	.4
7	3	4	1.1
6	14	18	5.0
5	18	36	6.4
4*	26	62	9.3
3	25	87	8.9
2	51	138	18.2
1	61	199	21.8
0	81	280	28.9

Note: Excludes Candidates Who Did Not Participate in All Components

*Qualifying Score

TABLE TWELVE A
NUMBER OF CANDIDATES IN EACH MATRIX CELL
OPERATIONS MANAGER

	COMPETENCY DEMONSTRATED		
	0	1	2
*MC1	93	123	62
*MC2	152	93	33
*MC3	117	141	20
*MC4	103	114	61
**EXPERIENCE	281	35	22
**TRAINING	259	52	27

*Weighted 1
**Weighted 2

TABLE TWELVE B
DISTRIBUTION OF MATRIX SCORES
OPERATIONS MANAGER

SCORE	FREQUENCY	CUM FREQ	%
12	3	3	1.1
11	1	4	.4
10	8	12	2.9
9	0	12	0.0
8*	15	27	5.4
7	16	43	5.8
6	30	73	10.8
5	35	108	12.6
4	34	142	12.2
3	44	186	15.8
2	49	235	17.6
1	33	268	11.9
0	10	278	3.6

Note: Excludes Candidates Who Did Not Participate in All Components

*Qualifying Score

TABLE THIRTEEN A
NUMBER OF CANDIDATES IN EACH MATRIX CELL
SYSTEMS MANAGER

	COMPETENCY DEMONSTRATED		
	0	1	2
*MC1	119	84	41
*MC2	130	71	43
*MC3	102	87	51
**EXPERIENCE	212	43	50
**TRAINING	218	43	44

*Weighted 2
**Weighted 3

TABLE THIRTEEN B
DISTRIBUTION OF MATRIX SCORES
SYSTEMS MANAGER

SCORE	FREQ	CUM FREQ	%	SCORE	FREQ	FREQ	CUM %
24	1	0.0	0	11	9	56	3.8
23	0	0.0	0	10	8	64	3.3
22	2	.8	1	9	6	70	2.5
21	1	0.0	2	8	22	92	9.2
20	3	1.3	3	7	7	99	2.9
19	1	0.0	3	6	18	117	7.5
18	7	2.9	6	5	15	132	6.3
17	6	2.5	9	4	26	158	10.8
16	2	.8	10	3	4	162	1.7
15	3	1.3	11	2	49	211	20.4
14	11	4.6	15	1	0	211	0.0
13	6	2.5	18	0	29	240	12.1
12*	4	17	20				

*Qualifying Score

TABLE FOURTEEN
MATRIX SCORES
TRAINING & EXPERIENCE (ROWS)
BY MULTIPLE CHOICE TESTS (COLUMNS)

Matrix	0	1	2	3	4	Total
0	82	47	35	17	6	187
1	17	14	15	9	3	58
2	12	16	10	9	6	53
3	4	2	1	3	2	12
4	1	3	4	3	1	12
TOTAL %	116 36.0	82 25.5	65 20.2	41 12.7	18 5.6	322 100.0

* Excluded from Further Verification

Number of Missing Observations = 57

TABLE FIFTEEN A
RELIABILITY ANALYSIS
TASK COMPETENCY SCORES (INCLUDING ZEROS)

		Mean	Std Dev	Cases
1.	SCORE01	.2296	.4211	379.0
2.	SCORE02	.1741	.3797	379.0
3.	SCORE03	.2691	.4441	379.0
4.	SCORE04	.3430	.4753	379.0
5.	SCORE05	.3694	.4833	379.0
6.	SCORE06	.2639	.4413	379.0
7.	SCORE07	.2375	.4261	379.0
8.	SCORE08	.3061	.4615	379.0
9.	SCORE09	.2559	.4370	379.0
10.	SCORE10	.3430	.4753	379.0
11.	SCORE11	.2058	.4048	379.0
12.	SCORE12	.2243	.4177	379.0
13.	SCORE13	.2216	.4159	379.0
14.	SCORE14	.3219	.4678	379.0
15.	SCORE15	.2507	.4340	379.0
16.	SCORE16	.1953	.3969	379.0
17.	SCORE17	.2559	.4370	379.0
18.	SCORE18	.1214	.3270	379.0
19.	SCORE19	.1873	.3907	379.0
20.	SCORE20	.2269	.4194	379.0

Alpha = .9489 Standardized item alpha = .9490

TABLE FIFTEEN B
RELIABILITY ANALYSIS
TASK COMPETENCY SCORES (EXCLUDING ZEROS)

		Mean	Std Dev	Cases
1.	SCORE01	.3850	.4877	226.0
2.	SCORE02	.2920	.4557	226.0
3.	SCORE03	.4513	.4987	226.0
4.	SCORE04	.5752	.4954	226.0
5.	SCORE05	.6195	.4866	226.0
6.	SCORE06	.4425	.4978	226.0
7.	SCORE07	.3982	.4906	226.0
8.	SCORE08	.5133	.5009	226.0
9.	SCORE09	.4292	.4961	226.0
10.	SCORE10	.5752	.4954	226.0
11.	SCORE11	.3451	.4765	226.0
12.	SCORE12	.3761	.4855	226.0
13.	SCORE13	.3717	.4843	226.0
14.	SCORE14	.5398	.4995	226.0
15.	SCORE15	.4204	.4947	226.0
16.	SCORE16	.3274	.4703	226.0
17.	SCORE17	.4292	.4961	226.0
18.	SCORE18	.2035	.4035	226.0
19.	SCORE19	.3142	.4652	226.0
20.	SCORE20	.3805	.4866	226.0

Alpha = .9090 Standardized item alpha = .9092

TABLE SIXTEEN
CORRELATION MARTIX OF COMPONENTS IN THE SELECTION SYSTEM

	MCONE	MCTWO	CREDNUM	TRAINHRS	TASKSCOR	SIM1
MCONE	1.00000					
MCTWO	.40821	1.00000				
CREDNUM	.08186	.25925	1.00000			
TRAINHRS	.15483	.13039	.05004	1.00000		
TASKSCOR	.18907	.16953	.15570	.24143	1.00000	
SIM1	.15547	.15942	.09845	.02407	.01880	1.00000
SIM2	.05193	.09356	-.00769	-.05411	-.00142	.22695

TABLE SEVENTEEN
FACTOR ANALYSIS OF VARIABLES IN THE SELECTION SYSTEM

Initial Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
S416H0	1.00000	*	1	1.84026	26.3	26.3
S416H1	1.00000	*	2	1.24323	17.8	44.0
CREDNUM	1.00000	*	3	.97485	13.9	58.0
TRAINHRS	1.00000	*	4	.89928	12.8	70.8
TASKSCOR	1.00000	*	5	.78947	11.3	82.1
SIM1	1.00000	*	6	.71315	10.2	92.3
SIM2	1.00000	*	7	.53976	7.7	100.0

PC extracted 2 factors.

VARIMAX Rotated Factor Matrix:

	Factor 1	Factor 2
S416H0	.63396	.24281
S416H1	.66603	.32001
CREDNUM	.45038	.10005
TRAINHRS	.55005	-.30076
TASKSCOR	.62296	-.20778
SIM1	.16480	.69818
SIM2	-.05370	.72249

ANSWER PAPER FOR EXPERIENCE & TRAINING QUESTIONNAIRE

SOCIAL SECURITY NUMBER

0 1 2 3 4 5 6 7 8 9

EXAM NO. (Mark only ONE.)	TITLE
32-709	Manager of Data Processing Technical Services (Data Base)
32-710	Manager of Data Processing Technical Services (Data Communications)
32-711	Manager of Data Processing Technical Services (Operations)
32-712	Manager of Data Processing Technical Services (Systems Processing)

EXPERIENCE

ANSWER ONLY IF YOU ANSWERED "1" TO THE QUESTION REGARDING WHETHER OR NOT YOU HAVE PERFORMED THIS TASK SINCE APRIL 17, 1991.

Task No.	Have you performed this task since April 17, 1991?	FREQUENCY: How often have you performed this task since April 17, 1991?	COMPETENCE: What is your level of competence in this task?	VERIFIER(S): Who can verify your level of competence in this task?
1	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
2	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
3	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
4	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
5	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
6	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
7	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
8	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
9	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
10	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
11	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
12	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
13	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
14	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
15	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
16	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
17	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
18	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
19	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5
20	0 1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+	1 2 3 4	1 2 3 4 5

TRAINING

21 Have you completed college credits in this speciality?

NO YES

22 If yes, how many college credits?

1 - 2 College Credits

3 - 5 College Credits

6 - 11 College Credits

12 or more College Credits

23 Have you completed non-credit training in this speciality since April 17, 1991?

NO YES

24 If yes, how many contact hours?

1 - 11 Contact Hours

12 - 23 Contact Hours

24 - 35 Contact Hours

36 - 47 Contact Hours

48 or more Contact Hours

November, 1993

Candidate Name:
Candidate Identification Number:

Exam No. 32-709

Manager of Data Processing Technical Services (Data Base)

EXPERIENCE AND TRAINING QUESTIONNAIRE

DIRECTIONS FOR
EXPERIENCE PORTION OF THE QUESTIONNAIRE

A. On pages 4 and 5 is a form entitled "Task Listing". It lists tasks that a person in the Data Base specialization may need to perform. Scan the entire list of tasks now, before completing any portion of this questionnaire. While scanning the tasks, think about who can verify the frequency with which you have performed the tasks and your level of competence for the tasks -- for example, a current or former supervisor. When you have scanned the tasks, return to these directions.

B. On pages 6 and 7 is a form entitled "Verifiers of Frequency and Competence". STOP NOW and complete that form. DO NOT complete any portion of this questionnaire until you have completed the form entitled "Verifiers of Frequency and Competence". When you have completed that form, return to these directions.

C. AFTER you have completed the "Verifiers of Frequency and Competence" form, place the machine readable answer paper and the "Task Listing" before you. For each task in the "Task Listing", indicate ON THE MACHINE READABLE ANSWER PAPER whether or not you have performed that task since April 17, 1991. Use the following scale:

Have Not Performed/Have Performed:

0 = I have not performed this task since April 17, 1991

1 = I have performed this task since April 17, 1991

If you have NOT performed a particular task since April 17, 1991, (i.e., you marked "0" on the machine readable answer paper), go on to the next task.

If you HAVE performed a particular task since April 17, 1991 (i.e., you marked "1" on the machine readable answer paper), indicate ON THE MACHINE READABLE ANSWER PAPER the following additional information regarding that task:

Frequency: How frequently (how many separate times) have you performed that task since April 17, 1991? (If you have performed that task more than 15 times, mark the 15+ bubble.)

Competence: What is your level of competence in that task? Select the statement below which best describes your level of ability in performing the task:

1 = Although I have performed this task in the past, I am not familiar with how to do it now.

2 = I have the ability to perform the routine parts of this task, but would need guidance in completing other parts of the task.

3 = I have the ability to independently perform all parts of this task, and can handle nearly all situations without guidance.

4 = I have an exceptional ability to perform this task. I am considered to be a master in this task, and am consulted by or direct others in carrying out even the most complicated aspects of this task.

Verifiers: Who (of the people that you listed on the "Verifiers of Frequency and Competence" form already) can verify your claimed frequency and level of competence for that task?

For each task, fill in the bubble (1 through 5) corresponding to the person on your "Verifiers of Frequency and Competence" form who can verify your frequency and level of competence for that task. For the Verifier(s) question only, you may fill in as many bubbles as you have Verifiers for a given task (e.g., if both person #2 and person #3 can verify your frequency and level of competence for a particular task, you should fill in both Verifier bubble #2 and Verifier bubble #3 for that task).

If none of the first three Verifiers can verify your frequency and level of competence for that task, but SOMEONE ELSE CAN, mark Verifier bubble #4 on your machine readable answer paper for that task, AND COMPLETE THE FORM ON PAGES 8 TO 10 ENTITLED, "IDENTIFICATION OF VERIFIER #4".

If NO ONE can verify your frequency and level of competence for that task, mark Verifier bubble #5 on your machine readable answer paper for that task, AND COMPLETE THE FORM ON PAGE 11 ENTITLED, "EXPLANATION FOR LACK OF VERIFIER".

You must indicate a person who can verify the frequency and level of competence that you claim for each task which you claim to have done. Failure to indicate someone who can verify your claimed frequency and level of competence (or, in the case of Verifier #5, failure to provide an acceptable explanation) may result in your not receiving credit for that task.

D. Check to make sure that you have responded on the machine readable answer paper to all 20 tasks. For each task, you should have indicated whether or not you have performed that task since April 17, 1991. For each task for which the answer was "1" (yes), you should have indicated how frequently you have performed that task, your level of competence for that task, and one or more persons who can verify your frequency and level of competence for that task.

E. When you have responded to all 20 tasks, continue with the Training portion of this questionnaire, beginning on page 12.

Task Listing

DATA BASE

Task #	Description
1	Prepares a conceptual data base model.
2	Prepares entity relationships.
3	Defines data base relationships and logical data structure diagrams.
4	Defines data elements for new data base systems and/or normalizes data elements.
5	Documents record layouts as they relate to data base records.
6	Defines technical considerations of data base file organization techniques and access methods, including storage considerations.
7	Reviews proposed applications designs for DBMS performance implications.
8	Defines data and/or verifies data base descriptions (schema).
9	Designs, codes, and implements data base access paths, data base interfaces, and specialized data base access routines.
10	Allocates and initializes physical data base files for testing and/or production.
11	Analyzes data base performance statistics and fine tunes data base.
12	Monitors data base mass storage utilizations and projects trends.
13	Resizes data base areas and/or tables.

14 Uses DBMS utilities to dump/recover files.

15 Reorganizes data bases.

16 Selects and activates DBMS security features.

17 Maintains and updates data dictionary.

18 Assists in evaluation and selection of DBMS and CASE software products, identifying advantages and disadvantages.

19 Performs and/or coordinates data base software upgrades and maintenance.

20 Works with DBMS vendors to resolve problems regarding data base software.

Verifiers of Frequency and Competence

Skim the Task Listing. Who can verify your frequency of performance and your level of competence in either some or all of the listed tasks? List below UP TO THREE people who can verify your frequency and level of competence. List only those people who, by virtue of their relationship to you while you learned or performed the tasks, are familiar with your experience in the tasks -- for example, current or former supervisors. For each Verifier, please PRINT or TYPE the information requested below: Illegible entries may result in your not receiving credit for some tasks.

The NYS Department of Civil Service reserves the right to contact the people you list for verification of your ratings, and to change your ratings if it is determined that you exaggerated either the frequency with which you have performed a task or your claimed level of competence for that task.

Verifier #1

Name: _____

Title: _____

Relationship to you: _____

Address: _____

_____

Phone: _____

Verifier #2

Name: _____

Title: _____

Relationship to you: _____

Address: _____

_____

Phone: _____

Verifier #3

Name: _____

Title: _____

Relationship to you: _____

Address: _____

_____

Phone: _____

Verifier #4 = Someone other than the above three people can verify your claimed frequency and level of competence for a task.

One or more of the above three people should be able to verify your frequency and level of competence for all or most of the tasks for which you claim experience. If, however, your experience in a particular task can be verified only by some OTHER person, indicate this by marking Verifier bubble #4 on your machine readable answer paper, AND PROVIDING THE IDENTIFYING INFORMATION REQUESTED ON THE FORM ON PAGES 8 TO 10 ENTITLED, "Identification of Verifier #4".

Verifier #5 = NO ONE can verify your claimed frequency and level of competence for a task.

Someone should be able to verify your frequency and level of competence for each task for which you claim experience. If, for some reason, there is a task for which NO ONE can verify your experience, indicate this by marking Verifier bubble #5 on your machine readable answer paper, AND PROVIDING AN ACCEPTABLE EXPLANATION ON THE FORM ON PAGE 11 ENTITLED, "Explanation for Lack of Verifier".

Identification of Verifier #4

For each task for which you indicated that someone OTHER than the three people listed on your "Verifiers of Frequency and Competence" form can verify your claimed frequency and level of competence (i.e., you marked Verifier bubble #4 on your machine readable answer paper), fill in the task number and the requested identifying information below. Please PRINT or TYPE your entries: Incomplete or illegible entries may result in your not receiving credit for some tasks.

Task # — Information about Verifier #4 (This Verifier may be different for different tasks)

____ Name: _____

Title: _____

Relationship to you: _____

Address: _____

_____

Phone: _____

____ Name: _____

Title: _____

Relationship to you: _____

Address: _____

_____

Phone: _____

____ Name: _____

Title: _____

Relationship to you: _____

Address: _____

_____

Phone: _____

____ Name: _____

Title: _____

Relationship to you: _____

Address: _____

_____

Phone: _____

____ Name: _____

Title: _____

Relationship to you: _____

Address: _____

_____

Phone: _____

____ Name: _____

Title: _____

Relationship to you: _____

Address: _____

_____

Phone: _____

If you need more space, attach additional sheets, using the same format.

Explanation for Lack of Verifier

For each task for which you indicated that NO ONE can verify your claimed frequency and level of competence (i.e., you marked Verifier bubble #5 on your machine readable answer paper), provide an explanation below as to why there is no Verifier. Please PRINT or TYPE your explanations: Incomplete or illegible explanations may result in your not receiving credit for some tasks.

The NYS Department of Civil Service reserves the right to deny credit for any task which lacks a justifiable reason for the lack of a Verifier.

Task #	Explanation
# ____	_____
	_____
	_____
	_____
	_____
# ____	_____
	_____
	_____
	_____
	_____
# ____	_____
	_____
	_____
	_____
	_____

If you need more space, attach additional sheets, using the same format.

Before completing this Training portion of the questionnaire, you should have completed the Experience portion of the questionnaire. If you have not completed the Experience portion, do so now, before completing this Training portion.

DIRECTIONS FOR TRAINING PORTION OF THE QUESTIONNAIRE

Please provide the information requested in the spaces below. When indicated, mark the appropriate bubbles on the separate machine readable answer paper enclosed with this questionnaire. You will be given credit for coursework and training that meets acceptable standards determined by the Department of Civil Service. You will not receive credit for coursework and training deemed not appropriate for the specialty under which you list it.

Acceptable training in the Data Base technical specialty would have covered topics such as: conceptual design of data bases; data structures (logical design); facilities planning; data base administration; data bases for multi-user networks (not for stand-alone pc applications). Training directed at applications development will NOT be accepted.

21. Have you completed any college coursework in the Data Base specialty? (College courses are acceptable regardless of the date on which they were completed.)

    Mark the appropriate bubble ("no" or "yes") next to question #21 on the separate machine readable answer paper.

    If your response is no, proceed to question #23 on this questionnaire.

    If your response is yes, indicate below the name(s) of the course(s), a brief description of what the course(s) covered, the name and location of the College where you took the course(s), and the number of credits received for each course. If you need more space, attach additional sheets, using the same format.

i) Course Name: _____
Course Description: _____
_____
_____
Name and Location of College: _____
_____
Number of Credits for Course: _____

ii) Course Name: _____
Course Description: _____
_____
_____
Name and Location of College: _____
_____
Number of Credits for Course: _____

iii) Course Name: _____
Course Description: _____
_____
_____
Name and Location of College: _____
_____
Number of Credits for Course: _____

iv) Course Name: _____
Course Description: _____
_____
_____
Name and Location of College: _____
_____
Number of Credits for Course: _____

22. Add up the number of college credits received for the Data Base courses listed above, and write it here: _____ Credits.

Record this total by marking the appropriate bubble ("1-2", "3-5", "6-11", or "12 or more") next to question #22 on the machine readable answer paper.

23. Since April 17, 1991, have you completed any non-college credit (vendor provided; employer provided; college non-credit; private training institution) training in the Data Base specialty?

To answer "yes", the training must have been completed since April 17, 1991. In addition, the training must have lasted at LEAST one full day (at least 6 contact hours), and may NOT have been a vendor product announcement or demonstration. Attendance at conferences with multiple workshops of less than one day is also NOT acceptable.

Mark the appropriate bubble ("no" or "yes") next to question #23 on the machine readable answer paper.

If your response to question #23 is "no", you have now completed the Training portion of the questionnaire for the Data Base specialty. Check to make sure that you have completed the Experience portion of the questionnaire. Then follow the instructions in the "General Directions" for returning your machine readable answer paper and completed questionnaire to the NYS Department of Civil Service.

If your response to question #23 is "yes", provide in the spaces below a description of what the training covered, the duration of the training (number of contact hours), the date(s) on which you received the training, the name and telephone number of the organization sponsoring or providing the training, and the name, address, and telephone number of some person (not a relative, co-worker, or friend) who can verify that you received the training. List ONLY training that meets the previously described criteria of recency, length, and sponsorship. If you need more space, attach additional sheets, using the same format.

i) Training Description: _____

_____

_____

_____

Duration of Training: _____ contact hours

Date(s) of Training: _____

Name of Training Sponsor/Provider: _____

_____

Telephone: _____

Name of Verifier: _____

Address of Verifier: _____

_____

Telephone number of Verifier: _____

ii) Training Description: _____

_____

_____

_____

Duration of Training: _____ contact hours

Date(s) of Training: _____

Name of Training Sponsor/Provider: _____

_____

Telephone: _____

Name of Verifier: _____
Address of Verifier: _____

_____

Telephone number of Verifier: _____

iii) Training Description: _____

_____

_____

_____

Duration of Training: _____ contact hours

Date(s) of Training: _____

Name of Training Sponsor/Provider: _____

_____

Telephone: _____

Name of Verifier: _____
Address of Verifier: _____

_____

Telephone number of Verifier: _____

iv) Training Description: _____
_____
_____
_____

Duration of Training: _____ contact hours

Date(s) of Training: _____

Name of Training Sponsor/Provider: _____
_____

Telephone: _____

Name of Verifier: _____
Address of Verifier: _____
_____

Telephone number of Verifier: _____

v) Training Description: _____
_____
_____
_____

Duration of Training: _____ contact hours

Date(s) of Training: _____

Name of Training Sponsor/Provider: _____
_____

Telephone: _____

Name of Verifier: _____
Address of Verifier: _____
_____

Telephone number of Verifier: _____

24. Add up the number of contact hours of Data Base training listed above, and write it here: _____ contact hours.

Record this total by marking the appropriate bubble ("1-11", "12-23", "24-35", "36-47", or "48 or more") next to question #24 on the separate machine readable answer paper.

You have now completed the Training portion of the questionnaire for the Data Base specialty. Check to make sure that you have also completed the Experience portion. Then follow the instructions in the "General Directions" for returning your machine readable answer paper and completed questionnaire to the NYS Department of Civil Service.