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An Actuarial Study of Scores Received by High School Seniors on the Cooperative School and College Ability Test and These Students' Grades Received During the First Year of Attendance in South Dakota Colleges

Donald D. Mott

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**AN ACTUARIAL STUDY OF SCORES RECEIVED BY HIGH SCHOOL
SENIORS ON THE COOPERATIVE SCHOOL AND COLLEGE
ABILITY TEST AND THESE STUDENTS' GRADES
RECEIVED DURING THE FIRST YEAR OF
ATTENDANCE IN SOUTH DAKOTA
COLLEGES**

BY

DONALD D. MOTT

**A thesis submitted
in partial fulfillment of the requirements for the
degree Master of Science, Department of
Education, South Dakota State
College of Agriculture
and Mechanic Arts**

August, 1959

AN ACTUARIAL STUDY OF SCORES RECEIVED BY HIGH SCHOOL
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ATTENDANCE IN SOUTH DAKOTA
COLLEGES

This thesis is approved as a creditable, independent investigation by a candidate for the degree, Master of Science, and acceptable as meeting the thesis requirements for this degree; but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Thesis Adviser

Head of the Major Department

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D. D. M.

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CHAPTER I

INTRODUCTION

In 1956 and 1957 college counselors felt a need for information concerning what South Dakota students were doing after they finished high school. Many questions were asked. Do out-of-state colleges lure away the outstanding students with scholarships? Do large numbers of the better students stay out of college? Do many students with great potential fail to do well in their high school studies? Are girls better achievers than boys? The South Dakota Guidance Association formed a committee to investigate some of these questions through a follow-up study.

Since South Dakota State College was administering the State-Wide Testing Program at that time for the Department of Public Instruction, the staff from there conducted this study. With the use of the data processing machines, a deck of punched cards was made up for the students who had graduated in 1957. The cards were sent to the high school administrators, who filled out the cards as to what the students were presently doing and how they ranked in their high school class. This information was returned, tabulated, and summarized in the SDEA Journal.¹

During the following year the writer felt that it would be valuable to see how these students did in their first year of college in South Dakota.

¹L. R. Palmerton, G. M. Fort, and D. Scobnell, "The High School Seniors of 1957--Where Are They in 1958?", SDEA Journal, pp. 18-20, April, 1958.

Problem

College and high school staffs have sought methods by which they could, with some degree of accuracy, predict success in college. The group in which the writer was interested was the group that came out of the secondary schools and went into college. Prediction studies of success in college are very valuable when counselors are working with the students. Students want to know for their own information what their possibilities are for academic success.

The problem selected by this writer was that of determining the value of the Cooperative School and College Ability Test in predicting success in college. This test is a test of "Developed Ability." When "Developed Ability" is mentioned, it indicates the ability of the student to do academic work on the next step of the educational ladder. Predicted success in college will be determined by the expected grade-point average derived from the test scores.

The members of the graduating class of 1957 in South Dakota who upon graduation attended a South Dakota college that same fall were selected as the sample for critical evaluation. The writer then proceeded to collect data about these students from the colleges. More detailed information will be given in Chapter III.

For this study various hypotheses have been formulated. Null hypotheses have been used for clarity of the analysis. The writer will reject the null hypotheses at the five per cent level. The use of a null hypothesis involved the assumption that any observed differences may be attributed to chance factors. The hypotheses will be tested on a sample

of 2,063 South Dakota students who graduated from high school in 1957 and continued on to a South Dakota college.

Definitions

The explanation of several terms used is necessary for the purpose of clarification.

"SCAT" is the abbreviation for the Cooperative School and College Ability Test. This term will be used extensively throughout this paper. There are three sub-divisions of this test which will be used, SCAT-V, SCAT-Q, and SCAT-TOT. SCAT-V is the verbal score; SCAT-Q is the quantitative score. SCAT-TOT is these two scores added for a total score.

"G.P.A." is the abbreviation for grade-point average. It is the arithmetic average of the grades received by each student in his first year of college.

"H.S.R." is the abbreviation for high-school rank. High-school rank refers to the position of the student in his senior class as it is based upon his total grades in high school. This study asked only for the classification of the students into quartiles.

Hypotheses

Following are the hypotheses which will be explored:

1. No significant relationship exists between SCAT-TOT and the first-year grade-point average received in South Dakota colleges.
2. No significant relationship exists between SCAT-V and the first-year grade-point average received in South Dakota colleges.
3. No significant relationship exists between SCAT-Q and the first-year grade-point average received in South Dakota colleges.

4. No significant relationship exists between SCAT-TOT and the first-year English grade received in South Dakota colleges.

5. No significant relationship exists between SCAT-V and the first-year English grade received in South Dakota colleges.

6. No significant relationship exists between SCAT-Q and the first-year English grade received in South Dakota colleges.

7. No significant relationship exists between SCAT-V and SCAT-Q.

8. No significant relationship exists between SCAT-V and SCAT-TOT.

9. No significant relationship exists between SCAT-Q and SCAT-TOT.

10. No significant relationship exists between SCAT-TOT and the students' high-school rank.

11. No significant relationship exists between SCAT-TOT and the first-year grade-point average as broken down by divisions at South Dakota State College.

12. No significant relationship exists between SCAT-V and the first-year grade-point average as broken down by divisions at South Dakota State College.

13. No significant relationship exists between SCAT-Q and the first-year grade-point average as broken down by divisions at South Dakota State College.

14. No significant relationship exists between SCAT-TOT and the first-year English grade as broken down by divisions at South Dakota State College.

15. No significant relationship exists between SCAT-V and the first-year English grade as broken down by divisions at South Dakota State College.

16. No significant relationship exists between SCAT-Q and the first-year English grade as broken down by divisions at South Dakota State College.

CHAPTER II

REVIEW OF THE LITERATURE

In order to provide background for this study, reports of the findings of several investigators who had done previous studies were reviewed. Many of the studies reviewed were designed to measure the extent of correlation which exists between test scores and success in college. Pertinent data from only a few of these have been selected for inclusion in this review.

The SCAT was created to take the place of the ACE Test. The ACE Test (American Council on Education--Psychological Examination) was designed to appraise the scholastic aptitude or general intelligence. The examination consists of six timed tests from which three scores are derived: the Q-score or quantitative score, L-score or linguistic score, and a Tot-score, which is a composite of the "Q" and "L" scores.

Dr. Arthur E. Traxler in his article, "Should SCAT Scat ACE?",¹ conducted a study in five independent schools. He correlated English marks with the SCAT-V score and the ACE-L score, mathematics marks with SCAT-Q and ACE-Q, and average marks with SCAT-TOT and ACE-TOT. His results were: English and SCAT-V were .535; English and ACE-L were .530; mathematics and SCAT-Q were .455; and mathematics and ACE-Q were .355; average marks and SCAT-TOT were .520; average marks and ACE-TOT were .480.

¹Arthur E. Traxler, "Should SCAT Scat ACE?", Educational Records Bulletin, No. 67, pp. 51-63, February, 1956.

The general conclusions indicated from his data were that the SCAT and the ACE were equally effective in predicting English marks of pupils in secondary schools and that the SCAT tended to predict mathematics marks and average marks more accurately than ACE. It was to be expected that the SCAT quantitative score would be more closely correlated with mathematics marks than the ACE score with mathematics marks, since the items in this part of the SCAT were more nearly samples of school work than most of the quantitative items in the ACE. On the whole, the superiority of the SCAT over the ACE in these correlations was so small that this data would hardly serve as a basis for a decision to use the SCAT in place of the ACE. The only difference that would occur would be the time element and the administration of the test. The SCAT takes a little longer for the student to take but is easier to administer.

In 1955, the Cooperative English Test was given to entering freshmen for the first time at Brigham Young University.² Of the 3,000 entering freshmen, a sample of 500 was selected at random to comprise the study group. At the end of their first year of college, the students' first-year grade-point averages were calculated.

The Cooperative English Test is divided into three major areas: (1) reading comprehension, (2) mechanics of expression, and (3) effectiveness of expression. The following coefficients of correlation were found between English test scores and first-year grade-point averages:

²V. H. Jensen and M. H. Clark, "A Prediction Study...of Cooperative English Test Scores," The Personnel and Guidance Journal, pp.635-36, May, 1958.

reading comprehension--0.413, mechanics of expression--0.542, effectiveness of expression--0.459, and total score--0.519.

Several other prediction studies have been made using the Cooperative English Test. Pierson and Jex³ at the University of Utah found a coefficient of correlation of 0.524 between the test scores and engineering grade-point ratios. Wallace⁴ computed a correlation of 0.289 and 0.381 on the vocabulary and reading parts, respectively, with the first-semester grades and grade-point ratios. Traxler⁵ found a correlation of 0.58 between the English test total and marks in vocational education.

In 1955 the Language Skills Research Laboratory at South Dakota State College undertook a study to determine how accurate the English Placement Test (Form E) and the ACE Test were in predicting freshmen grades. The sample included 525 students chosen from 1955 high school graduates for whom data was available. Table I represents the correlation of test scores with grades. Table II shows the predictability performance of the English Placement scores.

³George A. Pierson and Frank B. Jex, "Using the Cooperative General Achievement Tests to Predict Success in Engineering," Educational and Psychological Measurement, vol. 11, pp. 397-402, 1951.

⁴W. L. Wallace, "The Prediction of Grades in Specific College Courses," Journal of Educational Research, vol. 44, pp. 487-497, 1951.

⁵Arthur H. Traxler, "Some Comments on the Prediction of Differential Achievement in Technological College," Journal of Applied Psychology, vol. 27, pp. 176-179, 1943.

TABLE I. CORRELATIONS OF TEST SCORES WITH GRADES

Predictor	G.P.A. All Courses	Average For Year	English Grades		
			Fall	Winter	Spring
English Placement	.61	.70	.71	.69	.65
AGE "L"	.47	.62	.54	.55	.53
AGE Total	.51				
E.P. plus AGE "L"		.705			

TABLE II. PREDICTING SCHOLASTIC PERFORMANCE FROM ENGLISH PLACEMENT SCORES

(On the left are categories of English Placement Test raw scores. The table shows the chances in ten of students within these categories attaining the averages indicated at the top. Based on grades of 546 freshmen of 1955-56--all freshmen who completed high school in 1955 and whose test and grade data was available.)

E.P. Test Raw Score	Average Freshmen English Grade				
	F	D	C	B	A
20-29	6	4			
30-39	4	5	1		
40-49	1	5	4	*	
50-59	*	2	7	1	
60-69		*	6	3	*
70-79		*	3	5	1
80-89	*		2	4	4
90-99			1	3	7

TABLE II. (CONTINUED) PREDICTING SCHOLASTIC PERFORMANCE
FROM ENGLISH PLACEMENT SCORES

E.P. Test Raw Score	Grade Point Average, All Courses				
	0.0-0.5	0.6-1.5	1.6-2.5	2.6-3.5	3.6-4.0
	F	D	C	B	A
20-29	2	6	2		
30-39	1	6	3	*	
40-49		3	6	1	
50-59		2	6	1	*
60-69		1	6	3	
70-79		1	5	4	
80-89		1	3	5	1
90-99		*	1	6	3

* Indicates a probability of less than one in twenty. Probabilities greater than one in twenty are rounded off to the nearest tenth. All isolated cases are indicated by asterisks.

The English Placement score showed about the same superiority over the ACE "L" in predicting the grade-point average as in predicting the English average. First of all, this was outstanding because it was developed not as an aptitude test, but as an achievement test measuring a restricted set of linguistic skills. Secondly, this test is shorter (100 items) than the other tests to which it was compared.⁶

⁶Unpublished Research Study, The English Test as a Predictor of Freshmen Grades, Language Research Laboratory, South Dakota State College, December 20, 1956.

A few studies have been completed using the SCAT. Following is a list of the results of several SCAT validity studies that have been conducted.⁷ Since this test is a relatively new one, there have not been too many studies conducted on it yet.

⁷SCAT-STEP Supplement, Educational Testing Service, p. 13, Princeton, New Jersey, 1958.

INSTITUTION	DESCRIPTION OF SAMPLE	SUBSAMPLE	N	CRITERION	SCAT	r
Albright College	Entire entering freshman class, fall of '56, '57		126	End of year grades	Total	.43
Colorado State University	Entering freshmen from high schools, fall '56		506	Fall-quarter grades	Total Verbal Quant.	.55 .45 .45
College of William and Mary	Entering freshmen, fall of '55		456	1st-semester average	Total	.57
Virginia Polytechnic Institute	Entering freshmen, fall of '55	School of Ag.	139	End of year credit averages	Total Verbal Quant.	.56 .49 .46
		School of Bus.Ad.	103	End of year credit averages	Total Verbal Quant.	.44 .38 .36
		School of Engr.	548	End of year credit averages	Total Verbal Quant.	.46 .36 .43
			541	End of year grades	Total Verbal Quant.	.56 .51 .40
		School of Nursing	101	End of year grades	Total Verbal Quant.	.50 .39 .30
		School of Bus.Ad.	44	End of year grades	Total Verbal Quant.	.57 .34 .48
University of Denver	Entering freshmen, fall of '55	School of Bus.Ad.	195	End of year grades	Total Verbal Quant.	.50 .36 .33
		School of Arts and Sciences	189	End of year grades	Total Verbal Quant.	.51 .55 .41

In the fall of 1949, a study was conducted at South Dakota State College to determine the predictive value for the first-quarter grade-point average using the high school rank and the ACE-TOT.⁸ Both variables were significant with the high-school rank foremost. The study consisted of 446 incoming freshmen. A multiple correlation of .72294 was found by using the Wherry-Doolittle "Cookbook" method which also provides for the setting up of the regression and prediction equation. For this study the equation was: $Y = -.28308 + .01750 X_1 + .01258 X_2$ where Y equals the first-quarter grade-point average, X_1 equals high-school rank, and X_2 equals the ACE-TOT.

After the entire year's reports were compiled, another study was made using these three variables in predicting the first-year's grade-point average. The number used in this study was 331. The three variables used this time were: high-school rank, ACE-TOT, and local English. The multiple correlation was .68417. For this part of the study the regression or prediction equation was: $Y = -.11694 + .01054 X_1 + .0021 X_2 + .01633 X_3$. In this equation all the variables are in order of significance.

During the fall of 1956, the Cooperative School and College Ability Tests were administered to incoming freshmen at the University of South Dakota.⁹ Since the ACE test was given to South Dakota high-

⁸Unpublished Research Study, Student Personnel, South Dakota State College, 1951.

⁹R. H. Knapp, Unpublished Research Study, Psychological Testing Study, University of South Dakota, 1956.

school students during the senior year and the results published, a correlation of the two tests could be made. In finding the correlation coefficients, 201 students were available and the following results were obtained: (1) for the Verbal and Language part of both tests, .77; (2) for the Quantitative Symbols section, .71; (3) and for the Total of both, .62. The results showed that either of these tests may be used for an entrance testing program, or they may be used interchangeably from year to year.

Test scores are not used as absolute indicators of ability at the University of South Dakota, but they give an appreciable estimate of past learning at the time the test is administered. They also show past learning in comparison to the past learning of the students with which they will be competing for grades. Used in this fashion they become excellent, though not infallible, counseling tools.

In reading literature relative to this study it was found that a number of studies had been made using test scores for predicting success in college. It was noted that only a few studies had been made using the SCAT because it is a relatively new test which came on the market in 1955.

From the studies reviewed, these general conclusions might be drawn:

1. The SCAT and the ACE are of about equal value in predicting success in college.
2. English test scores are good predictors of success in college.

Description of the SCAT

Each test booklet in the SCAT series contains four relatively short sub-tests or parts. Two of these sub-tests, Parts I and III, are measures of developed ability in skills which are closely related to student success in the verbal types of school learning; the total number of right answers on these two parts of the test is converted into a Verbal Score. The two other sub-tests, Parts II and IV, are measures of ability in certain quantitative skills of number manipulation and problem solving, together yielding a Quantitative Score. The kinds of material in the four parts of the test are as follows:

Part I	30 sentence-completion tasks
Part II	25 numerical-computation tasks
Part III	30 vocabulary tasks
Part IV	25 numerical problem-solving tasks

Thus, the test yields a Verbal Score based on 60 tasks or questions and a Quantitative Score based on 50 tasks.

The SCAT has been designed and developed for the principle purpose of helping teachers and counselors--and students themselves--to estimate the capacity of each individual student to undertake the academic work of the next higher level of schooling. The test is a measure of developed ability, indicative of the relative academic success the student is likely to achieve in his next step up the educational ladder.

When the test is used for its principal purpose, it can aid the teacher to do the following things:

1. Identify at once those students who are especially talented or handicapped academically.
2. "Group" students of roughly similar levels of verbal and quantitative ability for certain instructional purposes.

3. Adapt or select instructional materials and processes to suit the learning levels and capacities of individual students.
4. Estimate the general level of instructional content and the teaching procedures most appropriate to the capacity of the class as a whole, and whatever "ability groups" there may be within the class.
5. Gauge the effort or motivation of the individual student by comparison of his capacity with his achievement.
6. Help the individual student to know himself better--his comparative levels of developed ability, his rate of progress, his present expectancy of future success in school.
7. Evaluate the comparative effectiveness of a unit or method of instruction by affording a "control" that describes the learning abilities represented in the class.

Similarly, when the test is used for its principal purpose, the counselor can apply the results in his work with students:

1. To help the student to understand his own strengths and weaknesses in comparison with students in certain norming groups.
2. To guide the student toward choices of educational goals and courses most appropriate for him.
3. To estimate the levels of achievement to be expected of the student.
4. To compare the measured academic abilities of students in different class, grade, and school groups.

And the administrator, even though the test is not designed especially for administrative uses, can make useful applications of the test results after the principal purposes of the testing have been achieved. Summarized score data from these tests can help him:

1. To estimate the average ability levels of class groups, grades, schools, and combinations of schools in the local education system.
2. To compare average ability levels and ranges of ability among class and school groups within the system.
3. To compare averages and ranges of scores earned locally with scores earned by students in the schools on which the tests have been normed.
4. To accumulate school and system data that will permit him to observe educationally important changes in the average levels of students in his schools.

Careful experimentation went into the construction of the test. While prediction studies related to academic success for a long-range period have not been completed, early reliability and validity studies indicated that the test has definite predictive value for school work. The test manual indicated the following which may be associated with the test:

Inferences that appear to have good support by the data available:

1. That the test measures certain limited verbal and quantitative abilities which are developed in school and are in themselves educationally important.
2. That the abilities measured have a considerable and positive relationship to the grade averages students earn in school.
3. That the scores earned by an individual on this test provide at least a partial estimate of that student's relative present capacity to succeed in his academic school work.

Inferences that are, at present, supported only by assumption of validity:

1. That the scores on this test have value for predicting the future academic success at the college level as at the secondary level.
2. That the scores on this test have the same or similar relationship to academic success at the college level as at the secondary level.
3. That scores on this test are indicative of ability to succeed in all of the kinds of academic learning in which verbal or quantitative skills are required.

Inferences which are not supported by any evidence of validity, and which the user of the tests should avoid in every case:

1. That scores on this test indicate the "intelligence" or "native capacity" of the student. (These tests do not attempt to measure IQ or mental development.)
2. That the abilities measured by the test are fixed and permanent characteristics of the student. (Since these are developed abilities they should always be susceptible to improvement or deterioration, based upon educational environment.)
3. That the scores on this test indicate an individual's likelihood of success in vocational training or in certain occupations. (They may have value in certain occupations, but they are for the academic kind of learning.)

The SCAT has three scores: "V" or Verbal Score, "Q" or Quantitative Score, and "TOT" or Total Score. These scores cover the same areas as did the ACE Test, but these scores are much more closely related to prediction of success in these academic areas.¹⁰

¹⁰Cooperative School and College Ability Test Examiner's Manual, Educational Testing Service, pp. 4-11, Princeton, New Jersey, 1955.

CHAPTER III

PROCEDURE

In this chapter the writer will explain the procedure used in compiling this data.

In the school year of 1956-57, the SCAT was initiated into the State-Wide Testing Program replacing the ACE Test. This test was administered to 97 per cent of the high-school seniors of South Dakota. This test was sent from South Dakota State College, where the program was being conducted. The answer sheets were returned to South Dakota State College where they were machine scored. The results from the tests and the names of the students were punched into IBM cards.

Another deck of IBM cards was duplicated and sent to the high-school administrators the following year as a follow-up study so as to determine where and what the seniors had done after they had gotten out of high school. Each card had the name of the student on it and also a questionnaire which was to be completed. The cards were then returned to South Dakota State College where this information was coded and punched into the cards. An article was written on this for the SDEA Journal entitled, "The High School Seniors of 1957--Where Are They in 1958?"¹

The following year South Dakota State College undertook the task of finding out how these students did in their first year of college in South Dakota. A letter was written to all the colleges in South Dakota

¹L. P. Palmerton, G. H. Fort, and D. Scannell, "The High School Seniors of 1957--Where Are They in 1958?", SDEA Journal, pp. 18-20, April, 1958.

asking for their cooperation in this study. The colleges were requested to send the grade-point average for the first-term and first-year's work and first-term and first-year's English scores. There was a very good return as 15 out of 16 colleges replied. This information was then coded and punched into the IBM cards which had the questionnaire printed on it.

The mathematical calculations were then completed by the use of the calculating punch and the desk calculator. The Pearson Product-Moment Correlation was used.

CHAPTER IV

THE FINDINGS AND INTERPRETATIONS OF DATA

Correlation coefficients have no meaning unless the significance of the magnitude of the coefficients is determined. For these product-moment correlation coefficients, tests of significance were made, utilizing the number of cases in each sample and the tabled values of the correlation at the five per cent level of significance. The writer when designing this study considered the nature of this prediction study and concluded that it did not have to be as rigorous as a study involving completely exact and objective measures. A study of this nature would be more meaningful when using the five per cent level of significance.

The following table is used throughout this chapter in determining whether or not the hypotheses are significant at the five per cent level. The one per cent level is also included for the reader's convenience. This table is extracted from Introduction to Statistical Analysis by Dixon and Massey.¹

¹W. J. Dixon and F. J. Massey, Jr., Introduction to Statistical Analysis, p. 164, McGraw-Hill Book Company: New York, N. Y., 1951.

TABLE III. CORRELATION COEFFICIENTS AT THE ONE AND FIVE PER CENT LEVELS OF SIGNIFICANCE

N	r.05	r.01	N	r.05	r.01	N	r.05	r.01
10	.632	.765	30	.361	.463	50	.279	.351
12	.576	.708	32	.349	.449	60	.254	.330
14	.532	.661	34	.339	.436	70	.235	.306
16	.497	.623	36	.329	.424	80	.220	.287
18	.468	.590	38	.320	.413	100	.197	.256
20	.444	.561	40	.312	.403	150	.161	.210
22	.423	.537	42	.304	.393	200	.139	.182
24	.404	.515	44	.297	.384	400	.098	.128
26	.388	.496	46	.291	.376	1000	.062	.081
28	.374	.479	48	.284	.368			

Table IV shows the correlation coefficients for SCAT-TOT, SCAT-V, and SCAT-Q as related to first-year grade-point average as broken down by South Dakota colleges. A total sample was also calculated to include all of the colleges.

TABLE IV. CORRELATION COEFFICIENTS FOR THE SCAT-TOT, SCAT-V, AND SCAT-Q AND THE FIRST-YEAR GRADE-POINT AVERAGE AS BROKEN DOWN BY SOUTH DAKOTA COLLEGES

Colleges	SCAT-TOT r	SCAT-V r	SCAT-Q r	N
1	.527*	.479*	.397*	253
2	.504*	.501*	.554*	415
3	.386*	.224*	.463*	149
4	.581*	.577*	.415*	257
5	.609*	.564*	.500*	70
6	.541*	.524*	.409*	96
7	.570*	.540*	.444*	109
8	.575*	.531*	.468*	187
9	.581*	.601*	.371*	73
10	.388*	.317*	.302*	75
11	.310	.333	.132	23
12	.542*	.538*	.388*	46
13	.185	.408	.315	11
14	.584*	.497*	.487*	37
15	.432**	.382**	.310	32
Total Sample	.478*	.438*	.390*	1833

* significant at the one per cent level.

** significant at the five per cent level.

The writer would first like to consider Hypothesis 1 as it was stated in Chapter I:

No significant relationship exists between SCAT-TOT and the first-year grade-point average received in South Dakota colleges.

As Table IV indicated the correlation coefficients for the SCAT-TOT ranged from .185 to .609 with ten of the fifteen colleges ranging from .527 to .609. The total sample was .478 which was significant at the five per cent level. Thus the null hypothesis was rejected, since such a relationship could only have occurred by chances less than five in one hundred times. There does seem to be a positive relationship between SCAT-TOT and first-year grade-point average in South Dakota colleges.

Next the experimenter examined Hypothesis 2 as it was stated in Chapter I:

No significant relationship exists between SCAT-V and the first-year grade-point average received in South Dakota colleges.

Correlation coefficients for the SCAT-V ranged from .224 to .601 with eight of the fifteen schools ranging from .501 to .601. The total sample r was .438, and it was significant at the five per cent level. Since it was at the five per cent level of significance, the null hypothesis was rejected. A positive relationship does exist between first-year grade-point average and SCAT-V in South Dakota colleges.

Now turning to Hypothesis 3 as stated in Chapter I:

No significant relationship exists between SCAT-Q and the first-year grade-point average received in South Dakota colleges.

Table IV also indicated that the correlations ranged from .132 to .554 with only two of the fifteen colleges going beyond the .500 correlation figure. The total sample was at the five per cent level of significance. Therefore, the null hypothesis was rejected. A positive relationship does exist between SCAT-Q and the first-year grade-point average in South Dakota colleges.

As pointed out in Table IV, two of the fifteen colleges were not significant in these three areas. The small size of the samples in both College 11 which has twenty-three and College 13 which has eleven students might give undue significance to deviations.

The mean scores and standard deviations for the first-year grade-point average received in a South Dakota college by South Dakota students who were freshmen in 1957-58 can be found in Table V.

TABLE V. MEAN SCORES AND STANDARD DEVIATIONS FOR FIRST-YEAR GRADE-POINT AVERAGE RECEIVED IN A SOUTH DAKOTA COLLEGE BY SOUTH DAKOTA STUDENTS WHO WERE FRESHMEN IN 1957-58

Colleges	Mean	Standard Deviation	N
1	2.280	.755	253
2	2.249	.720	415
3	2.299	.570	149
4	2.334	.581	257
5	2.517	.556	70
6	2.085	.748	96
7	2.485	.553	109
8	2.233	.719	187
9	2.289	.860	73
10	2.477	.616	75
11	2.334	.581	23
12	2.436	.569	46
13	2.463	.445	11
14	2.508	.497	37
15	2.262	.542	32
Total Sample	2.307	.683	1833

The range for the standard deviation was College 13 with a deviation of .445 to College 9 who had a deviation of .860. The standard deviation for the whole sample was .683. The means range for the first-year grade-point average was from 2.085 at College 6 to 2.517 at

College 5. The mean grade point average received by the total sample was 2.307.

A factor to keep in mind when examining Table V is that each college has its own grading system. For example, notice the mean grade point average for College 6 which was 2.085 and the mean grade point for College 14 which was 2.508. This may be an indication that a grade of "A" in College 14 may just be a grade of "C" in College 6. This factor must be kept in mind as this study is continued.

Table VI represents the standard deviations and the mean scores for SCAT-TOT, SCAT-V, and SCAT-Q for South Dakota colleges by South Dakota students who were freshmen in 1957-58.

TABLE VI. MEAN SCORES AND STANDARD DEVIATIONS FOR SCAT-TOT, SCAT-V,
AND SCAT-Q BY SOUTH DAKOTA COLLEGES FOR SOUTH DAKOTA STUDENTS
WHO WERE FRESHMEN IN 1957-58

Colleges	SCAT-TOT Mean	SCAT-TOT S.D.	SCAT-V Mean	SCAT-V S.D.	SCAT-Q Mean	SCAT-Q S.D.	N
1	73.529	15.191	40.758	9.608	32.770	8.155	253
2	75.513	15.630	40.628	9.859	34.884	8.304	415
3	87.093	10.556	44.966	8.029	42.127	4.915	149
4	68.381	15.269	37.171	9.494	31.210	8.315	257
5	66.400	15.131	36.214	8.814	30.185	8.483	70
6	67.947	15.774	38.447	10.284	29.500	7.803	96
7	61.715	15.480	32.504	9.600	29.211	8.282	109
8	73.935	14.957	41.711	9.170	32.224	7.991	187
9	68.123	16.298	37.246	10.933	30.870	7.853	73
10	68.440	13.245	36.733	8.940	31.706	7.804	75
11	70.086	12.386	39.521	8.809	30.565	7.575	23
12	73.000	15.893	39.978	10.154	33.021	8.481	46
13	67.454	16.380	38.272	9.519	29.181	8.749	11
14	66.891	12.791	37.297	8.914	29.594	6.286	37
15	69.093	14.066	39.093	9.142	30.000	8.558	32
Total Sample	72.405	16.006	39.426	9.929	32.979	8.582	1833

First looking at the standard deviations, the range for SCAT-TOT is 10.556 for College 3 to 16.380 for College 13. The standard deviation of the SCAT-TOT for the total sample was 16.006. Next looking at

SCAT-V, a range is found of 8.029 for College 3 to 10.933 for College 9. The SCAT-V standard deviation for the total sample was 9.929. The standard deviation for SCAT-Q was from 4.915 for College 3 to 8.749 for College 13. The total sample standard deviation for SCAT-Q was 8.582.

College 3 was consistently low on all of the standard deviation scores. College 13 was highest on two of the three areas. College 3 can then be said to have the most homogenous freshmen group with developed ability.

Now looking at the mean scores for this same group in SCAT-TOT, the means ranged from 66.400 for College 5 to 87.093 for College 3. The mean score for the total sample was 72.405. Going next to SCAT-V, a range of 32.504 for College 7 to 44.966 for College 3 was found. The mean for the total sample was 39.426. SCAT-Q had a range of 29.181 for College 13 to 42.127 for College 3.

College 3 had the highest mean scores in the three areas; and Colleges 5, 7, and 13 had the low mean scores.

In summarizing Table VI, College 3 has the smallest standard deviation scores and the highest mean scores which tends to show that this college has a very select group of good students having developed ability as compared to the other colleges. Colleges 9 and 13 had lower mean scores than the total sample means and also higher standard deviation scores on SCAT-TOT and SCAT-Q than the total sample which could mean two things: (1) The students had less developed ability. (2) The sample was not large enough to draw an inference.

The following table indicates the correlation between first-year grade-point average and SCAT-TOT, SCAT-V, and SCAT-Q as broken down by division at South Dakota State College.

TABLE VII: CORRELATIONS BETWEEN FIRST-YEAR GRADE-POINT AVERAGE AND SCAT-TOT, SCAT-V, AND SCAT-Q AS BROKEN DOWN BY DIVISIONS AT SOUTH DAKOTA STATE COLLEGE

Divisions	SCAT-TOT r	SCAT-V r	SCAT-Q r	N
1	.311*	.273**	.249**	69
2	.621*	.692*	.469*	117
3	.743*	.672*	.681*	69
4	.591*	.527*	.470*	68
5	.848*	.839*	.617**	11
6	.552*	.375*	.530*	55
7	.645*	.494**	.594*	26
Total Sample	.584*	.501*	.554*	415

* significant at the one per cent level.

** significant at the five per cent level.

Hypothesis 11 in Chapter 1 read as follows:

No significant relationship exists between SCAT-TOT and the first-year grade-point average as broken down by divisions at South Dakota State College.

Table VII shows there was a range of .311 to .848 with the correlation coefficients as computed by using SCAT-TOT and the first-year grade-point average. All the divisions were significant at the five per cent level. The total sample was .584 which was also significant at the five per cent level, therefore, rejecting the null hypothesis.

A positive relationship does exist between SCAT-TOT and first-year grade-point average for divisions at South Dakota State College.

Hypothesis 12 in Chapter I stated:

No significant relationship exists between SCAT-V and the first-year grade-point average as broken down by divisions at South Dakota State College.

As Table VII indicated, there was a somewhat larger range with SCAT-V. The range was from .273 to .839 with the total sample correlation coefficient at .501. All the divisions plus the total sample were significant at the five per cent level. The null hypothesis was rejected. There is a positive relationship between SCAT-V and first-year grade-point average by divisions at South Dakota State College.

Hypothesis 13 in Chapter I read:

No significant relationship exists between SCAT-Q and the first-year grade-point average as broken down by divisions at South Dakota State College.

The range for SCAT-Q in Table VII was smaller and lower than SCAT-TOT and SCAT-V. The correlation coefficients ranged from .249 to .689. Six of the seven correlation coefficients ranged between .469 to .689 with the seventh correlation being .249. The total sample was .554 which was significant at the five per cent level. All the divisions were significant at the five per cent level. This null hypothesis was rejected. A positive relationship exists between SCAT-Q and first-year grade-point average at South Dakota State College by divisions.

The total sample indicated that the SCAT-TOT was the best indicator of first-year grade-point averages with SCAT-Q the next best indicator.

Division 1 was consistently low on the three areas as compared to the other divisions with the same number of students. Looking forward to Table IX, Division 1 was consistently low on the mean scores for SCAT-TOT, SCAT-V, and SCAT-Q which would indicate that the students with the least developed ability were in this division.

There may be a reason for the low correlation in Division 1. In this division the courses in the first-year curriculum are made up of approximately one-third non-academic courses. The SCAT was designed to measure developed ability in academic courses. Therefore, correlations would have a tendency to be lower.

Table VIII indicates the mean scores and standard deviations for first-year grade-point average received at South Dakota State College by divisions for South Dakota students who were freshmen in 1957-58.

TABLE VIII. MEAN SCORES AND STANDARD DEVIATIONS FOR FIRST-YEAR GRADE-POINT AVERAGE RECEIVED IN SOUTH DAKOTA STATE COLLEGE BY DIVISIONS FOR SOUTH DAKOTA STUDENTS WHO WERE FRESHMEN IN 1957-58

Division	Mean	Standard Deviations	N
1	2.082	.667	69
2	2.233	.734	117
3	2.405	.836	69
4	2.380	.550	68
5	2.254	.913	11
6	2.076	.731	55
7	2.373	.633	26
Total Sample	2.249	.728	415

The standard deviation for South Dakota State College was .728. The range of standard deviations was .550 for Division 4 to .913 for Division 5. The mean grade-point averages were from 2.076 for Division 6 to 2.405 for Division 3. The total sample mean grade-point average was 2.249.

Divisions 1 and 6 had the lowest mean grade-point averages at South Dakota State College. Looking to Table IX, their mean SCAT-TOT scores are also below the other divisions. A possible reason for this may be that the students did not have as much developed ability and therefore did not do as well in college.

Table IX shows the standard deviations and the mean scores for those students who attended South Dakota State College as freshmen in 1957-58 and also graduated from a South Dakota high school.

TABLE IX. MEAN SCORES AND STANDARD DEVIATIONS FOR SCAT-TOT, SCAT-V, AND SCAT-Q BY DIVISIONS AT SOUTH DAKOTA STATE COLLEGE FOR SOUTH DAKOTA STUDENTS WHO WERE FRESHMEN IN 1957-58

Division	SCAT-TOT Mean	SCAT-TOT S.D.	SCAT-V Mean	SCAT-V S.D.	SCAT-Q Mean	SCAT-Q S.D.	N
1	68.376	14.761	36.565	9.400	31.811	8.422	69
2	79.820	14.957	41.102	10.199	35.719	6.559	117
3	75.840	17.689	41.811	10.278	34.028	9.116	69
4	75.455	14.507	41.426	9.255	34.029	8.249	68
5	78.818	13.163	43.272	7.291	35.545	7.994	11
6	74.054	14.399	41.054	9.541	33.000	7.790	53
7	76.038	13.843	42.038	8.561	34.000	7.810	26
Total Sample	75.513	15.630	40.628	9.859	34.854	8.304	415

The SCAT-TOT standard deviations ranged from 13.163 for Division 5 to 17.689 for Division 3. The total sample had a standard deviation of 15.630. SCAT-V had a range from 7.291 for Division 5 to 10.278 for Division 3. The SCAT-V total sample had a standard deviation of 9.859. SCAT-Q had a range of 6.559 for Division 2 to 9.116 for Division 3. The standard deviation for the total sample was 8.304.

Division 3 had the highest standard deviation on the three areas which indicated that there was a wide variety of scores for this

division. Division 5 was low on two out of three areas; but due to the small number of students in this division, no accurate conclusion can be drawn.

Going on to the next part of the table, the means for the divisions at South Dakota State College for SCAT-TOT ranged from 68.376 for Division 1 to 79.820 for Division 2. The total sample for SCAT-TOT was 75.513. For SCAT-V there was a range of 36.565 for Division 1 to 43.272 for Division 5 with a total sample mean of 40.628. SCAT-Q had a range of 31.811 for Division 1 to 38.719 for Division 2 with the total sample mean of 34.884.

Division 1 was consistently low on all three areas which indicated that this division had a tendency to have students with less developed ability than the other divisions. Division 2 was high on two out of three areas and was also higher on the third area than the total sample mean. This would be an indication that this division attracted students with better than average ability than the other divisions did. Division 5 should also be noted because of the standard deviation scores which were below the total sample and the mean scores which were above the total sample, indicating that there was a rather homogenous group with above average ability at South Dakota State College.

The following table shows the correlations between first-year English grades and SCAT-TOT, SCAT-V, and SCAT-Q as broken down by South Dakota colleges.

TABLE X. CORRELATIONS BETWEEN FIRST-YEAR ENGLISH GRADE AND SCAT-TOT, SCAT-V, AND SCAT-Q AS BROKEN DOWN BY SOUTH DAKOTA COLLEGES

Colleges	SCAT-TOT r	SCAT-V r	SCAT-Q r	N
1	.519*	.505*	.360*	247
2	.664*	.655*	.469*	417
3	.373*	.265*	.368*	148
4	.591*	.588*	.411*	251
5	.670*	.630*	.540*	66
6	.499*	.468*	.372*	82
7	.497*	.395*	.476*	94
8	.586*	.571*	.433*	182
9	.512*	.478*	.408*	60
10	.493*	.436*	.319*	69
11	.356	.510*	-.009	23
12	.338**	.446*	.081	41
13	.577**	.476	.561	11
14	.556*	.449**	.514*	29
15	.611*	.574*	.391**	32
Total Sample	.534*	.520*	.395*	1752

* significant at the one per cent level.

** significant at the five per cent level.

The investigator considered Hypothesis 4 as stated in Chapter I:

No significant relationship exists between SCAT-TOT and the first-year English grade received in South Dakota colleges.

As Table X points out, the correlation coefficients ranged from .356 to .670. Twelve of the fifteen colleges were above .493 and three of these schools ranged from .611 to .670. The total sample was .534 which was significant at the five per cent level. Thus the null hypothesis was rejected. There exists a positive relationship between SCAT-TOT and the first-year English grade in South Dakota colleges.

Going on to Hypothesis 5 as it is stated in Chapter I:

No significant relationship exists between SCAT-V and the first-year English grade received in South Dakota colleges.

Correlation coefficients for SCAT-V and the first-year English grade ranged from .265 to .655. Out of the fifteen colleges, thirteen of them extended the correlation coefficient of .436. The total sample was .520 which was at the five per cent level of significance. Therefore, the null hypothesis was rejected. SCAT-V and first-year English grade does seem to have a positive relationship in South Dakota colleges.

Turning to Hypothesis 6 as stated in Chapter I:

No significant relationship exists between SCAT-Q and the first-year English grade received in South Dakota colleges.

There was a very wide range of scores in this part of the table. The scores ranged from -.009 to .540. Only eight of the fifteen colleges were in the range of .408 to .540. The total sample correlation

coefficient was the lowest of the three but was still significant at the five per cent level. The null hypothesis was rejected. A positive relationship does exist between SCAT-Q and first-year English grade in South Dakota colleges.

As Table X indicated, both SCAT-TOT and SCAT-V can be used equally well in predicting first-year English grades. SCAT-Q was the poorest of the three, and the correlation coefficients were lower in most cases.

College 11 showed that a negative correlation existed between SCAT-Q and first-year English grade. The factor to be considered here was that the limited number of cases in this sample made it difficult to obtain an accessible correlation.

Comparing Table X with Table IV, the correlations coefficients for the first-year English grade were better than the correlation coefficient for first-year grade-point average. Here the fact that the SCAT is a test of developed academic ability should be taken into consideration. English is considered an academic course. Therefore, there would be a tendency for better correlations with English grades.

Table XI shows the mean scores and standard deviations for the first-year English grades received by South Dakota students in South Dakota colleges who were freshmen in 1957-58.

TABLE XI. MEAN SCORES AND STANDARD DEVIATIONS FOR FIRST-YEAR ENGLISH GRADE RECEIVED IN A SOUTH DAKOTA COLLEGE BY SOUTH DAKOTA STUDENTS WHO WERE FRESHMEN IN 1957-58

Colleges	Mean	Standard Deviations	N
1	2.312	.842	247
2	2.332	.812	417
3	2.368	.692	148
4	2.084	.918	251
5	2.209	.963	66
6	2.125	.767	82
7	2.532	.754	94
8	2.173	.915	182
9	2.085	1.032	60
10	2.492	.766	69
11	2.260	.781	23
12	1.829	.746	41
13	2.090	.363	11
14	2.344	.645	29
15	2.281	.613	32
Total Sample	2.261	.842	1752

The standard deviations ranged from .363 for College 13 to 1.032 for College 9. The total sample standard deviation was .842. The mean scores ranged from 1.829 for College 12 to 2.532 for College 7. The total sample mean was 2.261.

Here again the investigator would like to take into consideration that care must be used when comparing mean grade-point averages between colleges because each college has its own grading system. What may be equivalent to an "A" in one college may not be equivalent to an "A" in another.

The following table represents the correlation between first-year English grade and SCAT-TOT, SCAT-V, and SCAT-Q as broken down by divisions at South Dakota State College.

TABLE XII. CORRELATIONS BETWEEN FIRST-YEAR ENGLISH GRADE AND SCAT-TOT, SCAT-V, AND SCAT-Q AS BROKEN DOWN BY DIVISIONS AT SOUTH DAKOTA STATE COLLEGE

Divisions	SCAT-TOT r	SCAT-V r	SCAT-Q r	N
1	.535*	.511*	.662*	68
2	.686*	.637*	.573*	114
3	.800*	.817*	.629*	72
4	.634*	.575*	.470*	68
5	.945*	.876*	.756*	11
6	.595*	.664*	.303**	57
7	.640*	.592*	.482*	27
Total Sample	.664*	.655*	.469*	417

* significant at the one per cent level.

** significant at the five per cent level.

Hypothesis 14 as stated in Chapter I:

No significant relationship exists between SCAT-TOT and the first-year English grade as broken down by divisions at South Dakota State College.

Table XII presents the correlation coefficient range for SCAT-TOT and first-year English grade as broken down by divisions. The range for SCAT-TOT was .535 to .945. Five of the seven correlations ranged from .634 to .945. The total sample was .664 which was significant at the five per cent level. The null hypothesis was rejected. There is a positive relationship between SCAT-TOT and first-year English grades by divisions at South Dakota State College.

Turning to Hypothesis 15 in Chapter I:

No significant relationship exists between SCAT-V and the first-year English grade as broken down by divisions at South Dakota State College.

The correlation coefficients range for SCAT-V was .511 to .876 with four of the seven correlations .637 to .876. The total sample was .469 which was significant at the five per cent level. Thus, the null hypothesis was rejected. A positive relationship does exist between SCAT-V and first-year English grades by divisions at South Dakota State College.

Hypothesis 16 in Chapter I read:

No significant relationship exists between SCAT-Q and the first-year English grade as broken down by divisions at South Dakota State College.

SCAT-Q had a correlation coefficient range of .303 to .756. Three of the correlations ranged from .629 to .756. The total sample correlation was .655 which was significant at the five per cent level. The null hypothesis was rejected. A positive relationship does exist between SCAT-Q and first-year English grade at South Dakota State College by divisions.

SCAT-TOT in most cases had a higher correlation coefficient than did SCAT-V and SCAT-Q. SCAT-Q in most cases was lower than the SCAT-V. The total sample indicated that SCAT-TOT and SCAT-V had about the same predictive ability.

Comparing Table XII with Table VII, the SCAT-TOT and SCAT-V had better correlations coefficients with the first-year English grade than with first-year grade-point average. This also would be due to the fact that the SCAT measures developed academic ability and English is an academic course.

Table XIII represents the mean and standard deviation scores for the first-year English grade received at South Dakota State College by South Dakota students who were freshmen in 1957-58.

TABLE XIII. MEAN SCORES AND STANDARD DEVIATIONS FOR FIRST-YEAR ENGLISH GRADE RECEIVED AT SOUTH DAKOTA STATE COLLEGE BY DIVISIONS FOR SOUTH DAKOTA STUDENTS WHO WERE FRESHMEN IN 1957-58

Divisions	Means	Standard Deviations	N
1	1.930	.589	68
2	2.238	.771	114
3	2.466	1.026	72
4	2.302	.724	68
5	2.481	.890	11
6	2.303	.752	57
7	2.740	.681	27
Total Sample	2.332	.812	417

The standard deviation ranged from .589 for Division 1 to 1.026 for Division 3. The total sample standard deviation was .812. The means ranged from 1.930 for Division 1 to 2.740 for Division 7. The total sample mean was 2.332.

Division 1 had the smallest standard deviation and also the lowest mean which would indicate that this group of students received low grades in their first year of English work. Referring to Table IX, Division 1 had the lowest means on SCAT-TOE, SCAT-V, and SCAT-Q. This would substantiate the low mean grade-point average as this division did not have as good a developed academic ability as the other divisions.

Table XIV shows the intercorrelations among the sub-tests on the Cooperative School and College Ability Test. The total sample of 2,063 subjects was used for these correlations.

TABLE XIV. INTERCORRELATIONS AMONG THE SUB-TESTS ON THE SCHOOL AND COLLEGE ABILITY TESTS

SCAT Score	SCAT	
	Q	TOT
V	.485	.880
Q	----	.837
TOT	----	----

Hypothesis 7 stated in Chapter I:

No significant relationship exists between SCAT-V and SCAT-Q.

The total number of students (2,063) was used to arrive at these correlations. Table XIV shows that SCAT-V and SCAT-Q did not correlate as well as did SCAT-V and SCAT-TOT, SCAT-Q and SCAT-TOT. There was more of a relationship between the SCAT-V and SCAT-TOT, SCAT-Q and SCAT-TOT than there was between SCAT-V and SCAT-Q. The correlation coefficient was .485 which was significant at the five per cent level. The null hypothesis was rejected. There is a positive intercorrelation between SCAT-V and SCAT-Q.

Hypothesis 8 stated in Chapter I:

No significant relationship exists between SCAT-V and SCAT-TOT.

The correlation coefficient was .880 which was significant at the five per cent level. The null hypothesis was rejected. There is a positive relationship between SCAT-V and SCAT-TOT.

Hypothesis 9 stated in Chapter I:

No significant relationship exists between SCAT-Q and SCAT-TOT.

The correlation coefficient was .837 which was significant at the five per cent level. This null hypothesis was also rejected. There is a positive relationship between SCAT-Q and SCAT-TOT.

Hypothesis 10 as stated in Chapter I was:

No significant relationship exists between SCAT-TOT and the student's high-school rank.

Using the product-moment correlation method, the investigator used the entire sample and correlated SCAT-TOT and high-school rank. A correlation coefficient of .543 was computed, and it was significant at the five per cent level. The null hypothesis was rejected. A positive relationship does exist between SCAT-TOT and high-school rank for the entire sample.

Table XV shows the regression equations which may be used for determining grade-point averages a student may be expected to receive in college. The table also indicates the probable range in which this grade-point average may be.

TABLE XV. REGRESSION EQUATIONS FOR FOUR GROUPS OF COLLEGES IN SOUTH DAKOTA FOR PREDICTING FIRST-YEAR GRADE-POINT AVERAGE

Groups	r	Regression Equation	Standard Error of Estimate	N
University of South Dakota and South Dakota State College (not including engineering)	.560*	$Y = .026X + .352$	±.612	551
South Dakota School of Mines and South Dakota State College Division of Engineering	.516*	$Y = .025X + .173$	±.564	266
Private Colleges	.492*	$Y = .022X + .771$	±.599	484
Teacher Colleges	.527*	$Y = .021X + .944$	±.530	532

* Significant at the one per cent level.

To use an example of a regression equation, say that John Jones has indicated he wants to go to a teacher's college. On the SCAT he received a total score of 90. This score can then be taken and substituted for X in the formula $Y = .021X + .944$, and Y is found to be 2.834 with a standard error of estimate ±.530. The grade-point average will be within a range of 2.304 to 3.364 sixty-eight per cent of the time.

Taking another case, say that Joe Doe wants to go into engineering, and he wants to know what his chances are of success. Joe took the SCAT and received a total score of 95. Referring to Table XV, this score was substituted for X in the formula $Y = .025X + .173$, and the grade-point average was arrived at 2.548 with a standard error of estimate of ±.564. The counselor could tell Joe that a student with a score of

95 who goes into engineering in a South Dakota college accumulates a first-year grade-point average in the range of 1.984 to 3.112 sixty-eight per cent of the time.

With Table XVI it is possible to predict the first-term grade-point average that a student may accumulate when going into college. The same method should be followed here as it was in predicting the first-year grade-point average.

TABLE XVI. REGRESSION EQUATIONS FOR FOUR GROUPS OF COLLEGES IN SOUTH DAKOTA PREDICTING FIRST-TERM GRADE-POINT AVERAGE

Groups	r	Regression Equation	Standard Error of Estimate	N
University of South Dakota and South Dakota State College (not including engineering)	.570*	$Y = .033X - .275$	±.767	616
South Dakota School of Mines and South Dakota State College Division of Engineering	.525*	$Y = .032X - .400$	±.446	309
Private Colleges	.480*	$Y = .027X + .305$	±.774	532
Teacher Colleges	.453*	$Y = .021X + .899$	±.662	606

* Significant at the one per cent level.

In comparing Table XV with Table XVI, there was a noticeable difference in the size of the standard error of estimate. In three out of the four cases, the standard error of estimate was smaller for the first-year grade-point average than it was for the first-term

grade-point average. A factor involved here was that a certain percentage of the poorer students dropped out before the first year was completed which would have a tendency to lower the standard error of estimate. Also, students were adjusting to college-level work.

Throughout this chapter, hypotheses have been stated and tested. All the null hypotheses were rejected at the five per cent level indicating that there seemed to be a positive relationship between SCAT scores and grades received in college. SCAT-TOT has a tendency to be the best grade-point predictor of the three areas tested.

CHAPTER V

SUMMARY AND CONCLUSIONS

The Cooperative School and College Ability Test was administered to South Dakota seniors in the fall of 1956. The members of this class who continued on to a South Dakota college the following fall was the group which formed the basis for this study. The test scores from the SCAT plus the data from the colleges was used to determine the value of the Cooperative School and College Ability Test in predicting success in college.

First, a comparison was made with SCAT-TOT, SCAT-V, and SCAT-Q and first-year grade-point average in college as broken down by colleges in South Dakota and then by divisions at South Dakota State College. In every case there was a significant positive relationship between the SCAT and the first-year grade-point average.

Second, a comparison was made with SCAT-TOT, SCAT-V, and SCAT-Q and first-year English grade received in a South Dakota college as broken down by colleges in South Dakota and then divisions at South Dakota State College. In every case again there was a significant positive relationship between SCAT scores and first-year English scores.

Third, intercorrelations were computed between the different parts of the SCAT. A significant positive relationship again existed between the different parts.

Fourth, regression equations were computed so that grade-point averages could be predicted from the SCAT scores.

The conclusions reached from this study were:

1. The SCAT given in the senior year of high school has merit for predicting the grade-point average for a first-year college student in South Dakota.
 - a. In South Dakota there seems to be better correlations between state-supported institutions and SCAT scores. The SCAT has least significance with Liberal Arts colleges.
 - b. At South Dakota State College the SCAT has least significance with the Agricultural Division.
 - c. The larger colleges have a tendency for better correlations with the SCAT.
2. SCAT-TOT seems to have more value in predicting success in colleges than does SCAT-V or SCAT-Q.

Recommendations

From this study it seems to the writer that the following recommendations should be made:

1. This test should be continued in the State-Wide Testing Program.
2. Data from this thesis should be extracted and printed for distribution to counselors throughout the state.
3. A continuance of this study would be of great value:
 - a. Comparing the SCAT with academic courses and then comparing it with non-academic courses.
 - b. Considering more extensively the value of the first-term grade in predicting success in college.

- c. Considering the parent's occupation in predicting success in college.
- d. Considering high-school rank throughout the state of South Dakota in predicting success in college.

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APPENDIX



53

THE SOUTH DAKOTA COLLEGE PUBLIC RELATIONS ASSOCIATION

A SERVICE OF

AUGUSTANA COLLEGE • BLACK HILLS TEACHERS COLLEGE • DAKOTA WESLEYAN UNIVERSITY
GENERAL BEADLE STATE TEACHERS COLLEGE • HURON COLLEGE • MOUNT MARTY COLLEGE
NORTHERN STATE TEACHERS COLLEGE • SIOUX FALLS COLLEGE • SOUTH DAKOTA SCHOOL OF
MINES AND TECHNOLOGY • SOUTH DAKOTA STATE COLLEGE • SOUTHERN STATE TEACHERS COLLEGE
STATE UNIVERSITY OF SOUTH DAKOTA • YANKTON COLLEGE

APPENDIX A

Exhibit I

July 21, 1958

(Name)

(College)

(City), (State)

Dear _____:

At the College Public Relations meeting in Huron on July 15, you indicated that your college would cooperate in a research project of interest to the SDCPRA and to the South Dakota Guidance and Personnel Association. This project involves following up the high school graduates of 1957 to determine what happened to them in college. Another phase of this project involves the evaluation of the 1953-54 ninth grade testing program for these same students as it relates to their success in college.

On a separate sheet is outlined the data which we need for this study. The students which we are concerned about are only those who entered your college this fall and graduated from a South Dakota high school in the spring of 1957. Included in this study should be the names of students who started college but who did not complete a quarter or semester.

We would like to have all of the data listed on the attached page. If, however, your Records Office is somewhat resistant to providing all of the data, the essential data is the name, high school, and grade point average.

If there are any questions, please be sure and let me know as soon as possible.

Sincerely yours,

Gerald M. Fort
Associate Professor

Enc. 1

APPENDIX A

Exhibit II

NAME OF STUDENT

HIGH SCHOOL

FIRST TERM
GPA

FIRST YEAR
GPA

FIRST TERM
ENGLISH GRADE

FIRST YEAR
ENGLISH GRADE

FATHER'S
OCCUPATION



THE SOUTH DAKOTA COLLEGE PUBLIC RELATIONS ASSOCIATION

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- NORTHERN STATE TEACHERS COLLEGE • SIOUX FALLS COLLEGE • SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY • SOUTH DAKOTA STATE COLLEGE • SOUTHERN STATE TEACHERS COLLEGE
- STATE UNIVERSITY OF SOUTH DAKOTA • YANKTON COLLEGE

APPENDIX B

October 13 1958

 (Name)

 (College)

 (City), (State)

Dear _____,

The South Dakota Guidance and Personnel Association and the South Dakota College Public Relations Association is sponsoring a study of achievement of the 1957 high school graduates from South Dakota. The study involves all South Dakota high schools and we are attempting to evaluate the Ninth Grade State-Wide Testing Program, the Twelfth Grade State-Wide Testing Program, and the variable of size of high school as it affects success in college. Material relative to this study has been requested from all colleges in South Dakota and it was our understanding that we would work through the College Public Relations person, who could see that the material got into the proper hands at the individual college. Since Forrest Jones is the one assigned the responsibility, I had sent material to him on July 21 and followed it up with letters on September 12 and October 6. He now writes to me telling me that I should contact you for this information.

I am enclosing a sample copy of the kind of material that we need for the report. We are interested only in students from South Dakota high schools who graduated from high school in the spring of 1957 and who entered your college in the fall of 1957. Thus far we have received this data back from all of the four-year colleges but your school, and we are hoping for 100% participation.

If there are any questions, please do not hesitate to write or call me. We are hopeful that we can make a preliminary report at SDEA.

Sincerely yours,

Gerald M. Fort
 Associate Professor

Enc. 1

APPENDIX C

SOUTH DAKOTA HIGH SCHOOL SENIOR FOLLOW-UP STUDY

Please complete the questionnaire as accurately as possible by checking the appropriate answers. Check only ONE answer for each section. If items do not fit the situation please explain under F in lower right hand corner.

A. What was student's rank in class?

- (1) Upper one-fourth
 (2) Upper middle one-fourth
 (3) Lower middle one-fourth
 (4) Lower one-fourth
 (5) Dropped out of school
 (6) Transferred to
 High School

B. What is student presently doing?

- (1) In training beyond high school
 (all kinds)
 (2) Full time employment
 (3) Military Service
 (4) Housewife (for female)
 (5) Unemployed
 (6) Working for parent
 (7) Other
 (8) Information not available

C. If item (1) under "B" was checked indicate type of training

- (1) College
 (2) Trade School
 (3) Business college
 (4) Nursing (non-collegiate program)
 (5) Other (specify)

D. If item (1) in "C" was checked indicate college attended

- (1) Augustana College
 (2) Dakota Wesleyan
 (3) Huron College
 (4) Sioux Falls College
 (5) Yankton College
 (6) Freeman Junior College
 (7) Wessington Springs Junior College
 (8) Presentation Junior College
 (9) Mount Marty College

D. (continued)

- (1) University of South Dakota
 (2) South Dakota State College
 (3) School of Mines
 (4) Northern State Teachers College
 (5) General Beadle State Teachers College
 (6) Black Hills Teachers College
 (7) Southern State Teachers College
 (8) Out of state (specify)

E. If student went on to college, did he or she enter with a scholarship?

- Yes
 No

F. Additional Data

.....

Cooperative School and College Ability Tests

College Ability
Test

1955 All rights reserved  Cooperative Test Division · Educational Testing Service · Princeton, N. J. · Los Angeles 27, Calif.

Form **1**A

Catalog No. 151-01-1

General Directions

This is a test of some of the skills you have been learning ever since you first entered school. You should take it in the same way that you would work on any other new and interesting assignment.

The test is divided into four parts, which you will take one at a time. Give each one your close attention and do your best on every question. You probably will find some of the questions quite easy and others more difficult. You are *not* expected to answer every question correctly.

There are a few general rules for taking this test that will help you to earn your best score:

- Work carefully, but do not spend too much time on any one question. It usually is better to answer first all of the questions in the part that you know well and can answer quickly. Then go back to the questions that you want to think about.
- If you work at average speed you will have plenty of time to read and answer all of the questions. By leaving until last the questions that are most difficult, you will make best use of your time.
- You may answer questions even when you are not perfectly sure that your answers are correct. Your score will be the number of correct answers you mark.
- Put *all* of your answers on the answer sheet. This test booklet should not be marked in any way. Your examiner will give you an extra sheet of scratch paper to use when you do the number problems.
- Fill in all the information called for on the answer sheet and PRINT your name so that it can be read.
- Make sure that you understand instructions *before* you start work on any part. Ask the examiner to repeat the instructions if you do not understand exactly what you are to do.
- Make your answer marks on the answer sheet heavy and black. If you change your mind about an answer, be sure to erase your first mark completely.

If you give this test your best effort, your score will provide a good estimate of your ability in these important skills.

DIRECTIONS FOR PART I

Each question in Part I consists of a sentence in which one word is missing; a blank indicates where the word has been removed from the sentence. Beneath each sentence are five words, one of which is the missing word. You are to select the missing word by deciding which one of the five words *best* fits in with the meaning of the sentence.

Sample Question

We had worked hard all day so that by evening we were quite ().

- A** small **B** tired **C** old
D untrained **E** intelligent

If you understand the sample sentence you will realize that “tired” is the missing word because none of the other words fits in with the meaning of the sentence. Next, on the answer sheet, you find the line numbered the same as the question and blacken the space which has the same letter as the missing word. Because “tired” is the correct word to use in the sample sentence, and its letter is **B**, the space marked **B** on the answer sheet is blackened. See how it has been marked on the answer sheet. Do *not* make any marks in your test booklet.

PART I / TIME: 15 MINUTES

- 1** At the great packing houses every particle of the slaughtered animal is used, and many things that would be () in the small shops become a source of profit.
A wasted **B** valued **C** sold
D absorbed **E** utilized
- 2** Since the two questions were completely (), it was necessary to consider them separately.
F irrelevant **G** confused **H** unrelated
J irrational **K** theoretical
- 3** Animals are subject to diseases, infections, and injuries just as human beings are, but they cannot help the doctor by () their ailments.
A magnifying **B** ignoring **C** concealing
D bearing **E** describing
- 4** If those who are never happy unless they are working insist on putting in extra work to please themselves, they should not () that this is a painful sacrifice for them.
F discover **G** pretend **H** appreciate
J regret **K** wonder
- 5** The journey was as () as his victory in that it brought all that he had hoped for.
A long **B** tiresome **C** peaceful
D swift **E** fruitful
- 6** Like any other major operation, it should be resorted to only when less () measures fail.
F drastic **G** urgent **H** desirable
J protective **K** purposeful
- 7** His success in converting the audience to his way of thinking was largely a result of his () criticisms of the foregoing speaker's comments.
A limited **B** secret **C** many
D purposeful **E** persuasive
- 8** He cares little for the facts his pupils have stored in their memories; his aim is to build men, not to make ().
F schools **G** students **H** experiments
J encyclopedias **K** philosophers
- 9** Only the well-to-do can save money without ().
A insurance **B** inducement **C** privation
D disgrace **E** enjoyment
- 10** Kentuckians objected strenuously to the () of courts, which in some cases could not be reached without crossing the mountains.
F prejudice **G** number **H** inefficiency
J lack **K** inaccessibility
- 11** Despite his expressed () regarding the affairs of the world, he diligently followed all that went on, read widely, and often found himself better informed than his friends.
A wisdom **B** concern **C** complacency
D indifference **E** hopefulness
- 12** In a world of equality a man is recognized for what he does rather than for his ().
F cleverness **G** birth **H** character
J occupation **K** intelligence
- 13** If () were the real incentive to what its promoters call "do it yourself," the boom would have come in the thirties when people had to make do with so little.
A entertainment **B** competition
C economy **D** productivity **E** relaxation
- 14** The treaties were to remain in force for ten years and were subject to () unless terminated by any signatory on twelve months' notice.
F limitation **G** ratification **H** agreement
J renewal **K** nullification
- 15** The crises in history are the times at which questions that have been () for centuries suddenly yawn wide open.
A crucial **B** closed **C** asked
D unknown **E** discussed
- 16** In this society which deemed manual toil a badge of (), very seldom did a laborer break the fetters which bound his class and reach high political station.
F courage **G** hardship **H** democracy
J inferiority **K** strength
- 17** Most of the facts that you excavate from the archives, like all () of past human activity, are dumb things.
A sources **B** kinds **C** lessons
D relics **E** opinions
- 18** The tides present a striking () whose essence is that while the force that sets them in motion is cosmic, presumably acting impartially on all parts of the globe, the nature of the tide at any particular place is a local and highly individual matter.
F progression **G** paradox **H** power
J rhythm **K** coincidence

Go on to the next page.

- 19 No other man in politics, his admirers said, could have brought together so many () interests and made so effective a combination.
A hostile **B** comparable **C** deep
D harmonious **E** forgotten
- 20 However strongly American patriots may have desired a () cultural life, they could not, as men and women of ideas, taste, and learning, turn their backs on the wealth of traditional European culture.
F personal **G** leisurely **H** distinctive
J broad **K** universal
- 21 Work is activity () an end; play activity is an end.
A without **B** after **C** for
D until **E** upon
- 22 Despite all our enthusiasm for the cathedrals and their sculptures, the world that produced Gothic architecture is () to ours.
F comparable **G** unknown **H** allied
J comprehensible **K** alien
- 23 During the war the scientist who had been cloistered in a university laboratory and had taken pride in paying no heed to the possible () of his findings was thrust into emergency work of the most lethally practical sort.
A fallacies **B** applications **C** reputation
D distortion **E** suppression
- 24 We understand each other only because large numbers of people over great areas of the earth have lived in mutual agreement that certain words are () for certain meanings and not for other meanings.
F substitutes **G** sounds **H** symbols
J necessary **K** ambiguous
- 25 Maugham thinks that the prose drama is the least () of the arts and that practically all prose plays find their resting places on the library shelves after their brief day or few decades in the theater.
A studied **B** topical **C** unpopular
D enduring **E** dignified
- 26 The gorgeous pages of piano arpeggios and figurations in the finale are not simply externals for display: they are () strands in a texture of romantic expression.
F integral **G** disparate **H** technical
J ornamental **K** melodious
- 27 He had the advantage of competence without the () of being a pedant.
A superiority **B** need **C** toil
D desire **E** limitation
- 28 The escape of neutrons from a quantity of uranium is a surface effect depending on the area of the surface, but fission capture occurs throughout the material and is therefore a () effect.
F subsidiary **G** permanent **H** volume
J larger **K** characteristic
- 29 There is an adultness in the quality of his dialogue, in his frequent allusions to art and literature, that would () the hypothetical "average" reader.
A delight **B** alienate **C** benefit
D deceive **E** warn
- 30 The mining camps, given over as they were to material ends, direct action, and boisterous recreation, presented in most respects the very () of the conventional morals and intellectual values of the eastern regions.
F degradation **G** antithesis **H** beginnings
J anathema **K** antagonist



Stop. If you finish before time is called, check your work on this part. Do not go on to Part II until you are told to do so.

DIRECTIONS FOR PART II

There are 25 problems in Part II of the test. Following each problem there are five suggested answers. Work each problem in your head or on a piece of scratch paper. Then look at the five suggested answers and decide which one is correct. Blacken the space under its letter on the answer sheet.

Because the correct answer to the sample problem is 586, which is lettered **F**, the space marked **F** on the answer sheet is blackened. See how it has been marked on the answer sheet. Do *not* make any marks in your test booklet.

Sample Problem

5413 **F** 586 **G** 596 **H** 696
 -4827 **J** 1586 **K** None of these

Do not turn this page until you are told to do so.

PART II / TIME: 20 MINUTES

$$\begin{array}{r} 1 \quad \frac{2}{7} \\ + \frac{1}{2} \\ \hline \end{array}$$

- A $\frac{3}{14}$
 B $\frac{1}{3}$
 C $\frac{9}{14}$
 D $\frac{11}{14}$
 E None of these

$$2 \quad 1\frac{1}{3} \times 1\frac{1}{2}$$

- F $1\frac{1}{8}$
 G $1\frac{1}{6}$
 H $1\frac{1}{5}$
 J 2
 K None of these

$$3 \quad \begin{array}{r} 64444 \\ -55555 \\ \hline \end{array}$$

- A 8889
 B 9999
 C 18889
 D 19999
 E None of these

$$4 \quad \begin{array}{r} 3 \text{ pounds } 4 \text{ ounces} \\ 6 \text{ pounds } 9 \text{ ounces} \\ + 4 \text{ pounds } 4 \text{ ounces} \\ \hline \end{array}$$

- F 13 pounds 7 ounces
 G 14 pounds 1 ounce
 H 14 pounds 5 ounces
 J 14 pounds 7 ounces
 K None of these

$$5 \quad 15\% \text{ of } 30$$

- A .45
 B .5
 C 2
 D 200
 E None of these

$$6 \quad \frac{2}{5} - \frac{2}{15}$$

- F $\frac{1}{5}$
 G $\frac{4}{15}$
 H $\frac{1}{3}$
 J $\frac{2}{3}$
 K None of these

$$7 \quad \text{Change } \frac{5}{12} \text{ to a per cent.}$$

- A $37\frac{1}{2}$
 B 40
 C $41\frac{1}{3}$
 D $41\frac{2}{3}$
 E $42\frac{1}{3}$

$$8 \quad 3\overline{)38813}$$

- F 149
 G 1048
 H 1049
 J 1051
 K None of these

$$9 \quad 42.8 - 4.19$$

- A .9
 B 38.61
 C 38.71
 D 38.79
 E None of these

$$10 \quad 2\frac{1}{2} \times 2\frac{1}{2}$$

- F 1
 G $4\frac{1}{4}$
 H 5
 J $6\frac{1}{25}$
 K $6\frac{1}{4}$

$$11 \quad 9\frac{3}{5} \div 1\frac{9}{10}$$

- A $\frac{3}{32}$
 B $\frac{25}{216}$
 C $8\frac{16}{25}$
 D $10\frac{1}{5}$
 E $10\frac{2}{3}$

$$12 \quad 2\overline{)3 \text{ feet } 6 \text{ inches}}$$

- F 1 foot 3 inches
 G 1 foot 8 inches
 H 1 foot 6 inches
 J 1 foot 9 inches
 K None of these

$$13 \quad 8 \div 2\frac{1}{2}$$

- A $\frac{5}{16}$
 B $3\frac{1}{16}$
 C $3\frac{1}{5}$
 D 20
 E None of these

$$14 \quad 5000 - 100.05$$

- F 4899.95
 G 4900.05
 H 4900.95
 J 4999.95
 K None of these

$$15 \quad 6 \div \frac{1}{3}$$

- A $\frac{1}{18}$
 B $\frac{1}{2}$
 C 2
 D $1\frac{9}{3}$
 E None of these

$$16 \quad \begin{array}{r} 7\frac{1}{10} \\ 5\frac{2}{3} \\ + 11\frac{5}{6} \\ \hline \end{array}$$

- F $23\frac{3}{5}$
 G $24\frac{17}{30}$
 H $24\frac{3}{5}$
 J $24\frac{19}{30}$
 K $24\frac{2}{3}$

$$17 \quad .12\overline{)1524}$$

- A 1.27
 B 12.7
 C 127
 D 1270
 E 12,700

$$18 \quad \text{What is the sum of } .875 \text{ and } 1\frac{1}{5}, \text{ written as a decimal?}$$

- F 995
 G 1.075
 H 2.075
 J 2.125
 K None of these

$$19 \quad \frac{59}{60} - \frac{49}{50}$$

- A $\frac{1}{3000}$
 B $\frac{1}{300}$
 C $\frac{1}{60}$
 D $\frac{1}{50}$
 E $\frac{1}{30}$

8% of $17\frac{1}{2}$

- F 1.4
- G 5.36
- H 13.6
- J 14
- K None of these

4 yards 1 foot 2 inches
- 3 yards 1 foot 11 inches

- A 3 inches
- B 2 feet 1 inch
- C 2 feet 3 inches
- D 9 feet 1 inch
- E None of these

22 8 pounds 4 ounces \div 3

- F 2 pounds $1\frac{1}{3}$ ounces
- G 2 pounds 2 ounces
- H 2 pounds 8 ounces
- J 2 pounds 12 ounces
- K None of these

23 $84 = (?)\%$ of 70

- A $83\frac{1}{3}$
- B $116\frac{2}{3}$
- C 120
- D 125
- E None of these

24 The average of $7\frac{1}{3}$ and $8\frac{1}{2}$ is

- F $7\frac{5}{12}$
- G $7\frac{5}{6}$
- H $7\frac{1}{12}$
- J 8
- K None of these

25 Change .4375 to a fraction.

- A $\frac{7}{16}$
- B $\frac{7}{18}$
- C $\frac{7}{20}$
- D $\frac{17}{40}$
- E None of these



Stop. If you finish before time is called, check your work on this part. Do not go back to the previous part. Do not go on to Part III until you are told to do so.

DIRECTIONS FOR PART III

Each of the questions in Part III consists of one word in large letters followed by five words or phrases in small letters. Read the word in large letters. Then pick, from the words or phrases following it, the one whose meaning is closest to the word in large letters. For example:

Sample Question

chilly

- tired B nice C dry
- cold E sunny

In order to find the correct answer you look at the word **chilly** and then look for a word or phrase below it that has the same or almost the same meaning. When you do this you see that "cold" is the answer because "cold" is closest in meaning to the word "chilly." Next, on the answer sheet you find the line numbered the same as the question and blacken the space which has the same letter as the word you have selected as the correct one. Because "cold" is the correct answer to the sample question, the space marked **D** on the answer sheet is blackened. See how it has been marked on the answer sheet. Do *not* make any mark in your test booklet.

Do not turn this page until you are told to do so.

PART III / TIME: 10 MINUTES

1 breed

- A consolidate
- B keep alive
- C labor
- D dwell
- E produce offspring

2 affiliate

- F subordinate
- G stranger
- H associate
- J competitor
- K kinsman

3 recur

- A hold in bounds
- B alternate
- C revolve
- D happen again
- E save

4 partiality

- F favoritism
- G regularity
- H insufficiency
- J friendliness
- K divisibility

5 longevity

- A expansion
- B long life
- C long-suffering
- D senility
- E remoteness

6 obscene

- F inhuman
- G indecent
- H fawning
- J out of date
- K dim

7 reimburse

- A collect
- B grow larger
- C pay back
- D give new strength
- E reward

8 clemency

- F absolution
- G promptness
- H delicacy
- J peacefulness
- K mercy

9 rectify

- A justify
- B set right
- C cure
- D purify
- E set erect

10 affect

- F happen
- G produce
- H handle
- J influence
- K result

11 intact

- A coarse
- B reticent
- C unimpaired
- D abrupt
- E uncontrollable

12 ultimate

- F high
- G final
- H lowest
- J eternal
- K distant

13 bibliography

- A table of contents
- B index
- C account of a life
- D study of ancient books
- E list of writings

14 illicit

- F vicious
- G absent
- H unrecorded
- J false
- K unlawful

15 ostracism

- A eastern cult
- B banishment
- C conviction
- D criticism
- E heresy

16 forego

- F travel far
- G temporize
- H relinquish
- J bring to conclusion
- K grab

17 applicable

- A adhesive
- B straightforward
- C capable
- D easily reached
- E suitable

18 rabble

- F defeated army
- G rough stone
- H noisy mob
- J festival
- K shapeless mass

19 evolve

- A unfold
- B initiate
- C shirk
- D spin
- E think over

20 dogged

- F loyal
- G brutal
- H determined
- J ragged
- K playful

21 fetus

- A ambush
- B foul odor
- C unborn young
- D bondman
- E contraband

- 2 rue**
F feel guilty
G be terrified
H spoil
J regret
K make trouble
- 3 copious**
A drunk
B plentiful
C toilsome
D complete
E tottering
- 4 glower**
F provide warmth
G squint
H throw out sparks
J look angrily
K shine through
- 25 embellish**
A celebrate
B enliven
C make war on
D add ornaments to
E brighten
- 26 clandestine**
F effeminate
G spiteful
H secret
J dishonest
K eccentric
- 27 buffet**
A encroach
B strike
C polish
D brandish
E subdue
- 28 parsimony**
F frugality
G rhythm
H acquisitiveness
J eastern religion
K inheritance
- 29 dearth**
A scarcity
B plague
C dissolution
D frustration
E odium
- 30 cataclysm**
F massacre
G waterfall
H whirlpool
J severing
K upheaval



Stop. If you finish before time is called, check your work on this part. Do not go back to either previous part. Do not go on to Part IV until you are told to do so.

DIRECTIONS FOR PART IV

There are 25 problems in Part IV of the test. Following each problem there are five suggested answers. Work each problem in your head or on a piece of scratch paper. Then look at the five suggested answers and decide which one is correct. Blacken the space under its letter on the answer sheet.

Because the correct answer to the sample problem is 8, which is lettered **H**, the space marked **H** on the answer sheet is blackened. See how it has been marked on the answer sheet.

Do *not* make any marks in your test booklet.

Sample Problem

Four \$10-bills are equal to how many \$5-bills?

- 20 **G** 10 **H** 8
 40 **K** 2

PART IV / TIME: 25 MINUTES

- 1 John has 10 marbles, Mike has 2 more than John, and Pete has 2 more than Mike. How many marbles do John, Mike, and Pete have together?
- A 26
B 32
C 34
D 36
E 38
- 2 A telephone directory has $12\frac{1}{2}$ pages of listings for a certain town. If the average number of telephone numbers per page is 120, how many telephones are listed for this town?
- F 1400
G 1440
H 1446
J 1460
K 1500
- 3 A man worked $7\frac{1}{2}$ hours starting at 8:15 a.m. with no time out for lunch. At what time did he finish?
- A 3:15 p.m.
B 3:45 p.m.
C 4:15 p.m.
D 4:45 p.m.
E 5:45 p.m.
- 4 A brief case is marked \$39.50 plus tax. If the tax is 20%, how much must the customer pay for the brief case?
- F \$31.60
G \$40.29
H \$41.48
J \$47.40
K \$49.38
- 5 $\frac{2 + 4}{(?) = 1}$
- A $\frac{1}{8}$
B $\frac{1}{6}$
C 1
D 6
E 8
- 6 If a roll of quarters has 40 quarters and a roll of dimes has 50 dimes, what is the value of 3 rolls of quarters and 5 rolls of dimes?
- F \$27
G \$45
H \$55
J \$80
K \$125
- 7 John spent \$1.00 of his allowance on a book, half the remainder on a movie, and then had 60 cents left. What was his allowance?
- A \$1.60
B \$2.10
C \$2.20
D \$2.40
E \$2.60
- 8 For each cup of coffee either $1\frac{1}{4}$ measures of coffee X or $1\frac{1}{2}$ measures of coffee Y are used. How many fewer measures of X than Y would be needed to make 10 cups of coffee?
- F $2\frac{1}{2}$
G 5
H 10
J $12\frac{1}{2}$
K 15
- 9 Which of the following is the smallest possible sum of four United States coins, no two of which are of the same denomination?
- A 17 cents
B 41 cents
C 81 cents
D 86 cents
E 90 cents
- 10 How much more do 4 dozen two-for-a-nickel gumdrops cost than 5 dozen three-for-a-nickel gumdrops?
- F $1\frac{2}{3}$ cents
G 20 cents
H 24 cents
J 40 cents
K \$1.20
- 11 The mean elevation of California is 2900 feet above sea level. How many feet below the mean elevation of California is Death Valley, which is 282 feet below sea level?
- A 2182
B 2618
C 2859
D 3041
E 3182

- 12** At the rate of 45 words per minute, how many hours will it take a typist to type a 7200-word article?
- F** $1\frac{3}{5}$
G $2\frac{1}{3}$
H $2\frac{2}{3}$
J $3\frac{3}{4}$
K 16
- 13** A farmer uses 35 pounds of a certain spray dust per acre of land. If this dust is 3% DDT, how many pounds of DDT (to the nearest pound) does he use on a 21-acre field?
- A** 1
B 22
C 24
D 105
E 245
- 14** In January a salesman sold $\frac{2}{3}$ of his monthly quota. If he sold \$660 worth of merchandise, what was his monthly quota?
- F** \$220
G \$330
H \$440
J \$880
K \$990
- 15** What is the average of 1 pound 5 ounces and 2 pounds 15 ounces?
- A** 1 pound 10 ounces
B 1 pound 15 ounces
C 2 pounds 2 ounces
D 2 pounds 10 ounces
E 3 pounds 2 ounces
- 16** A hotel needs window curtains requiring $1\frac{1}{8}$ yards of material each. How many of these curtains can be made from a 72-yard bolt of material?
- F** 63
G 64
H 80
J 81
K 82
- 17** One inch is equal to approximately 2.5 centimeters. Twenty centimeters are equal to approximately how many inches?
- A** 8
B $12\frac{1}{2}$
C $22\frac{1}{2}$
D 25
E 50
- 18** If each stroke of a file removes 0.0016 inch of metal, how many strokes are needed to reduce the thickness of a metal block from 9.27 inches to 8.95 inches?
- F** 20
G 50
H 200
J 500
K 2000
- 19** In a certain company, 5 employees got a \$20 bonus, 16 got a \$50 bonus, and 9 got an \$80 bonus. What was the average bonus for these 30 employees?
- A** \$25
B \$30
C \$50
D \$54
E \$75
- 20** The bill for a pair of shoes and a pair of skates was \$19.50. If the skates cost \$1.50 more than the shoes, how much did the skates cost?
- F** \$9.75
G \$10.00
H \$10.50
J \$10.75
K \$11.25
- 21** If 2 yards 9 inches of material cost \$4.95, what is the cost per yard?
- A** \$1.71
B \$1.86
C \$2.20
D \$2.83
E \$3.96
- 22** If the property in a city is assessed at \$75,000,000 what tax rate is necessary to raise \$6,000,000 in property taxes?
- F** 0.6%
G 0.8%
H 4.5%
J 6%
K 8%
- 23** If a table is sold for \$60 after a 20% discount, what was the price before the discount?
- A** \$12.00
B \$48.00
C \$72.00
D \$75.00
E \$80.00

- 24** In a certain high school, 25% of the girls and 50% of the boys attended a football game. If 48% of all the students are girls, what per cent of all the students went to the game?

F $33\frac{1}{3}$
G 36
H $37\frac{1}{2}$
J 38
K 75

- 25** Two machines plus three men can do the work that 16 men did with no machines. How many men will a dozen of these machines replace?

A 18
B 36
C 78
D 96
E 156

**If you finish before time is called,
check your work on this part. Do
not go back to any previous part.**