THE ANALYSIS OF THE EFFECTS ON STUDENT COGNITION OF
THE FILMSTRIP SERIES, INTRODUCTION TO ECONOMICS,
UNIT I, MICROECONOMICS, WHEN USED AS A
SUPPLEMENT IN A PRINCIPLES OF
MICROECONOMICS CLASS

THESIS

Presented to the Graduate Council of the
North Texas State University in Partial
Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

Laura Sponseller Wiggs, B. B. A.
Denton, Texas
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Two teachers with two classes each participated in the research, which used a modified Campbell and Stanley equivalent time series design. Each class was randomly assigned four of eight filmstrips. Both experimental and control classes heard lectures on a module, the experimental group viewed the filmstrip, and both were posttested.

Independent variables controlling for student differences, module difficulty, student attitudes, and the critical independent variable, viewing of the filmstrip (View), were regressed on student cognition. In the analysis, significant at the .001 level, View exerted a significant positive influence on cognition scores. No relation was discovered between student attitudes toward filmstrips and increased cognition.
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CHAPTER I

INTRODUCTION AND SURVEY OF THE LITERATURE

Background and Significance
Of The Problem

Although economic literacy is imperative in a democratic society, for many students the only training ever received on economic issues comes in one course—the principles of economics.

Economics educators generally agree that the concepts presented in such a principles course are complex. Three decades ago a subcommittee of the American Economic Association reported that

. . . the content of the elementary course has expanded beyond all possibility of adequate comprehension and assimilation by a student in one year of three class hours a week" (18, p. 924).

A wealth of research in the past decade has focused on the effectiveness of computer-assisted instruction, simulation, games, seminars, programmed learning, self-paced study, and other deviations from the traditional lecture system; however, there is little research evaluating the efficiency of audio-visual aids in economic education.

Because of the tremendous resources appropriated to the creation of audio-visual materials, a study which evaluates the effectiveness and efficiency of an instructional delivery
system for the introductory principles course is extremely important. This project will evaluate the use of a series of eight filmstrips in an introductory course on principles of microeconomic theory.

The filmstrips examined, *Introduction to Economic, Unit I, Microeconomics*, coauthored by William A. Luker and David A. Martin (10), were used to supplement a traditional lecture approach.

The questions addressed by the research may be stated as follows:

1) Does viewing the filmstrips, *Introduction to Economics, Unit I, Microeconomics*, result in measurable cognitive gains for the students who view them?

2) Are favorable attitudes toward filmstrips associated with greater cognitive gains?

**Hypotheses**

Hypothesis I asserts that viewing of the Luker-Martin filmstrip series, *Introduction to Economics, Unit I, Microeconomics*, as a supplement to the traditional classroom lecture will result in significant, measurable cognitive gains for students.

Hypothesis II states that students with positive attitudes toward the filmstrips will register greater cognitive gains than those students with less favorable attitudes toward the filmstrips.
Survey of the Literature

Although only a few of the last decade's many research projects focused specifically on audio-visual aids in economic education, several studies in other curriculum areas made significant contributions to this project and will be reviewed in the section, "Indirectly Related Studies." The studies which evaluate audio-visual aids in economic education are reviewed in the section, "Directly Related Studies."

The existing research projects which evaluated specific delivery systems frequently report contradictory findings. Subsequent research projects which attempt to explain the inconsistencies will be reviewed in the section, "Distribu- tional Effects." Finally, articles concerning the improvement of research techniques are grouped under "Techniques of Research."

Indirectly Related Studies

In a 1975 dissertation at the University of Maryland, Melissa Jayne Sullivan (20) compared the effectiveness of print and non-print media presentations in the teaching of literature, using an identical film, sound filmstrip, and book. Third graders were assigned randomly to one of three treatment groups in each of the twenty classrooms. The classroom teacher showed the film to one group of ten students, showed the sound filmstrip to another group of ten students, and read the book to the third group of ten students. The analysis revealed no
significant difference among the three methods of presentation. She concluded that the sound filmstrip, costing less than the film, was as effective; and, therefore, a teacher could feel confident in using whatever method of presentation he preferred.

Anthony Fair's dissertation (16) at The Catholic University of America suggested that media using combined visual and auditory communicative modes result in more effective learning than either sound or print used alone. The film and filmstrip which involved pictorial images and soundtrack were more effective than either the printed narration or soundtrack on both immediate and delayed recall. Print only was found to be more effective than the auditory presentation when used alone.

Lee Morrison (14) conducted a study to evaluate the effectiveness of the sound filmstrip as a medium for the enrichment and implementation of a sophomore English literature course. The same instructor taught two groups of students a unit on the Greek theater. One group was taught in the conventional manner, while the other was taught by means of the addition of a sound filmstrip. The analysis supported the hypothesis that greater immediate learning and greater retention of learning would occur with the use of film and filmstrip. The research concluded that sound filmstrips could be used effectively to enrich college literature courses and
other humanities subjects. The researcher advocated further evaluation of filmstrips, particularly as a means of enrichment rather than as the sole means of teaching.

Directly Related Studies

Some of the best sources of study on the use of video presentations in economics are the evaluations of the televised course, "The American Economy." This course ran on 182 CBS stations, 54 educational stations, and 5 independent stations during 1962-63. Thirty-two of the 160 half-hour lessons concerned teaching methods, while 132 focused on economic content. The total audience was over a million, with 5,000 taking the course for credit at 361 colleges and universities.

In a study of the television series conducted by Saunders, the Test of Economic Understanding (TEU), designed primarily for high school students, was given to 71 television students, 113 Carnegie Tech students enrolled in a one-year course in economics, and a control group of 73 schoolteachers "substantially identical to the TV students, but who had not watched 'The American Economy'" (17, p. 398). The television group had approximately the same score as the college sophomores and a significantly higher score than the control group. A multiple-regression analysis identified one other variable besides enrollment in the CBS course for credit that significantly affected the outcome, namely a previous course in economics.
McConnell and Felton (12) conducted a controlled experiment involving twenty-seven students who enrolled in the CBS-TV course for credit matched with twenty-seven students from a large, live lecture course at the University of Nebraska who were similar in grade point average, number of hours completed, and course of study. On TEU questions, designed primarily for high school students, those enrolled in the television course did better; however, the live groups performed significantly better than the television group on 100 of 120 multiple choice questions prepared by the author for college level students. Because the television course did not aim to go much beyond what the Committee for Development's Task Force Report specified high school students should know, omitting such concepts as marginal cost and marginal revenue, the seemingly contradictory findings in the studies are not inconsistent.

In the most ambitious study related to the television presentation, which was conducted by the National Opinion Research Center and reported by Bach and Saunders (1), a 25-item version of the TEU was given to 3966 teachers. Watching the television course was by far the most important variable, its coefficient being twice as large as that of taking five or more college courses in economics.

A 1964-1965 experiment reported by McConnell (11) used a matched-pair technique to compare teaching by McConnell on
television; McConnell in a large, live lecture class; McConnell in a small, live lecture class; and graduate assistants at the University of Nebraska. Although measured cognitive gains were not significantly different for any of the teaching methods, television was significantly worse than each of the other options in relation to student attitude.

In a follow-up experiment at Nebraska by McConnell and Lamphear (13), 440 students were permitted a choice of television lectures or no lectures at all. Evaluation found no significant difference in achievement at the .05 level, although attitude surveys revealed a preference for the lectureless method. A subsequent report by Lamphear and McConnell indicated that the lectureless group and the television group did better than the students taught by the graduate assistants.

Paden and Moyer (15) found no differences at the University of Illinois in amount learned between groups taught by live lectures, television, and programmed instruction, but the attitude toward live instruction was more favorable than toward the other two.

Although nothing in the research indicates that television lectures are superior to live lectures, it does suggest that television presentations can be equally as effective. Siegfried and Fels (18) concluded from the various findings that students possibly learn as much from television lectures
but prefer live lectures; however, they feel that sophisticated testing of such hypotheses has been limited.

**Distributional Effects**

Inconsistent findings in evaluations of specific delivery systems have prompted subsequent studies to identify the confounding causes. For example, Margaret Louise Brooks conducted a study concerning students' cognitive styles of learning which explored three major questions:

Can a student's cognitive style be considered a significant predictor of success in the mastery of the content of a unit of self-administered instruction?

Does the student's cognitive style contribute significantly to the gain score on a unit of self-administered instruction when there are no administrative restrictions placed on the number of times a unit may be reviewed to reach a prespecified criterion of performance?

Can a significant source of variability in the time required to reach a prespecified criterion of performance be accounted for by the student's cognitive style?

The study concluded that a student's cognitive style contributes significantly to performance on a self-administered unit of instruction. It was further concluded that a student's cognitive style, which reflects not only his manner of perceiving and analyzing visual stimuli, but reflects as well the nature of his personality and the mode of his intellectual functioning, should be given consideration when assigning students to learning environments (4, p. 781-A).

Emil Anthony Ciccoretti (5) in a dissertation at Wayne State University also concluded that individualization of instruction could be implemented more effectively through
knowledge of a student's educational cognitive style. He further suggested that appraisal of a student's strengths and weaknesses should include cognitive style mapping as well as achievement.

Larry Rex Gray (6) studied the ability of an individual to select an appropriate learning environment. His analysis confirmed the hypothesis that, when individuals were given the opportunity to select a preferred learning environment, they were capable of selecting the one more appropriate to their educational cognitive style.

In the Siegfried and Fels article, "Teaching College Economics: A Survey," one generalization became apparent—diversity is indispensable. Different students learn in different ways, and a variety of techniques may dominate any single one (18).

Hansen, Kelley, and Weisbrod (7) observed that students differ in previous preparation, verbal and mathematical abilities, career goals, sex, social concern, and many other characteristics. Consequently, they are likely to benefit differentially from any particular method. It is impossible to assess the economic efficiency of a particular method without evaluating the benefits received by various individuals.

Luker (9), in a study that focused on four different delivery systems, discovered that none of the systems caused
a significantly different level of achievement; however, the way the student perceived the delivery system was positively related to the score achieved by use of that system.

A good example of the distribution of benefits can be found in the study by Bonello, Davisson, and Swartz, who report that lower-achievement students in an experiment at Notre Dame benefited from computer-assisted instruction (CAI), while better students did not.

This occurred in the presence of a non-significant overall effect and illustrates why it is important to identify precisely the target group and assess the impact of educational experiments on specific subgroups of students (3, p. 937).

These studies which delve into the methods of learning could be valuable in planning the presentation of the economics courses if learning patterns could be identified and related to the most effective instructional delivery system.

Techniques of Research

In their review of 179 research projects in economic education, Siegfried and Fels discuss the techniques of research, noting that accurate measurement is, of course, an integral part of competent research. The authors outline four measures:

1. absolute achievement--the posttest score;
2. absolute improvement--the difference between the posttest and the pretest score;
3. percentage improvement--absolute improvement divided by the pretest score;
4. gap-closing measure--absolute improvement divided by the potential gain in score (which is the difference between the perfect score and the pretest score).

The absolute achievement score reflects the level of understanding at a point in time. It is a stock measure. The absolute improvement score measures the increment of learning during a course. An alternative is to use the posttest achievement score and control for initial economic understanding by including the pretest score as an independent variable in the regression analysis. The percentage improvement and gap-closing measures were developed because there may not be a constant difficulty of learning throughout the spectrum from total ignorance to total mastery; thus any aggregate measure of success should measure improvements by students on the basis of the difficulty of achieving them. The percentage improvement form implies that it is more difficult for poorer students to improve their scores by a given absolute amount. The gap-closing measure implies the opposite, that it is more difficult to improve a score by a given amount if one starts at a higher level of mastery (because only the most difficult material remains to be mastered) (18, p. 929).

It is also important to be aware that a student's incentive makes a great deal of difference. For example, sometimes tests which measure output in an experiment count toward grades, sometimes not. Wehrs found that counting the TUCE, when it was used as a posttest, made a 12 percent difference in absolute score (and a gain difference of 40 percent) after holding constant the pretest score, high school rank, age, and sex. Since the scores used for the pretest norms generally did not count toward grades at all, improvement is generally biased upward (21).

Siegfried and Fels also advocate the improvement of research methodology through improved modeling. They contend
that little thought has been given to model specification and maintain that functional form has been determined arbitrarily in many cases:

... a substantial gap remains between theorizing and empirical research. Progress can be made by synthesizing and integrating the empirical work with the insights that are available from comprehensive theoretical models based on maximizing behavior.

... most research conclusions continue to rest on single equation models. The effect of the alternative technique may be to improve the marginal product of some other factor that is already included in the equation. For example, by using separate equations, Siegfried and Strand found that self-paced instruction was more effective for females than for males.

One of the better modeling efforts is the Harvard project. It constructs and estimates a three-equation model that adapts to the non-linearities and simultaneity inherent in the educational process. The model includes an equation describing student decisions about the allocation of time and effort; a production function equation that relates student effort, ability, and pedagogy to achievement; and a "profit function" relating student effort and achievement to student enjoyment of the course. Estimates from a constant elasticity of substitution form of the production function reveal "elasticities" of achievement with respect to student ability, pedagogic inputs, and effort of roughly .89, .40, and .25 (18, p. 955).

The Siegfried and Fels article (18) also advises that research in economic education would be more credible if evaluation of innovative teaching technologies were conducted by individuals other than those who devise the new methods. There is always danger that the innovator invests substantially more time in teaching an experimental course, in which case advantages attributed to a new method actually may be returns to
faculty effort. If the innovation is implemented and evaluated by someone other than the initiator, this danger is reduced.

Another criticism is that too many studies in economic education have been one-school, one-time experiments which do not provide sufficient observations. Replication would add to the sample size and improve confidence in the objectivity of assessments of teaching methods (18, p. 956).

Siegfried and Fels evaluate the state of the art in economic education research by commenting as follows:

A cumulative literature on economics education has now developed . . . . Those who do research must search the literature for previous findings and build on them, bringing to bear the tools of economic theory and econometrics. The quality of the research done so far varies widely, but dramatic improvement has occurred in recent years (18, p. 959).
CHAPTER BIBLIOGRAPHY


CHAPTER II

METHODOLOGY

The Sample

The universe is composed of all students in the principles of economics classes at Weatherford College and North Texas State University. The sample, which is considered a sample out of the flow of time, consisted of 62 students enrolled in two sections of microeconomics at Weatherford College (a two-year community college in Weatherford, Texas) and 88 students enrolled in two sections of microeconomics at North Texas State University (a four-year university at Denton, Texas) during the spring of 1982. Each of eight cognitive posttests for 150 students was treated as a case, thus enlarging the sample size to 1200 cases.

The Model

The model used to test each hypothesis may be stated as a multiple linear equation:

\[ Y = A + B_1X_1 + B_2X_2 + B_3X_3 \ldots B_nX_n + E \]

where "Y" represents the composite score on the posttests given after each module, "A" was the constant term or vertical intercept, and the "B's" represented raw beta coefficients for
the variables included in the equation. The variables are defined as follows:

\[X_1 = \text{View (The Critical Independent Variable)}\]
\[X_2 = \text{Pretest Scores (TUCE)}\]
\[X_3 = \text{School (Weatherford College or NTSU)}\]
\[X_4 = \text{Gender}\]
\[X_5 = \text{Grade-Point Average}\]
\[X_6 = \text{Classification}\]
\[X_7 = \text{Previous Hours Attempted or Completed in Economics}\]
\[X_8 = \text{Place of Birth}\]
\[X_9 = \text{Missing or Actual Data Points on Pretest Scores}\]
\[X_{10} = \text{Difficulty Index of Module Viewed}\]
\[X_{11} = \text{Pre-experiment Attitudes Toward Filmstrips}\]
\[X_{12} = \text{Inter*PFI}\]
\[\text{Interaction of Pre-experiment attitudes with View}\]

A detailed listing of these variables, with coding labels and values used in the regression, is found in Appendix A, Table II.

Design

The design used in this study is a modification of a Campbell and Stanley (3) equivalent time samples design using four intact groups, the outline of which is schematically illustrated in Figure 1 on the next page.
The symbols are defined as follows:

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<th>Symbol</th>
<th>Description</th>
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<tr>
<td>G1 to G4</td>
<td>Class Sections</td>
</tr>
<tr>
<td>O1</td>
<td>Pretest (TUCE 30 questions)</td>
</tr>
<tr>
<td>O2</td>
<td>Posttest (Module 1)</td>
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<td>Filmstrip, Module 7</td>
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<tr>
<td>X8</td>
<td>Filmstrip, Module 8</td>
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Procedures

In the research design used, every class was both a control group and an experimental group at different times. Each instructor's first section was assigned four filmstrips using the flip of a coin to assure random selection. The second section of each instructor was then assigned the remaining four filmstrips. In this manner, each instructor used all eight filmstrips, but each section viewed only four modules. Also, each instructor taught an experimental group and a control group on every unit.

Each instructor analyzed the text material (1, 10) and the concepts from the filmstrip modules to coordinate the
modules with the text. The results of those correlations are presented in Tables V and VI in Appendix B. After the instructor delivered his lecture over the text material, a filmstrip that coordinated with the material was shown to the experimental group. The instructor then administered the posttest to both experimental and control groups. Because of time constraints, posttests were sometimes given during the following class period.

Instructors did not use the posttests as part of the student grade; therefore students were aware that they were involved in an experimental evaluation. The students were not given full details, since the researchers theorized that unbiased findings were more likely to result. The instructors requested that students complete posttests to the best of their ability and further introduced the filmstrips as excellent review for the course exams which would, of course, count toward their course grade. The students were instructed to mark the correct answers on the test papers, a practice which usually produces more accurate results.

Instruments

Demographics

Demographics collected from each student at the beginning of the semester included school, class meeting time, gender, self-reported grade-point average, classification (freshman
through graduate), previous hours completed or attempted in economics, and place of birth. A copy of the student information sheet is included in Appendix C.

Attitudinal Semantic-Differential Pretest

At the beginning of the semester, a semantic-differential pretest was administered, its purpose being to evaluate student attitude toward filmstrips, economics, study, and visual aids. In the semantic differential, pairs of polar adjectives are arranged at opposite ends of a series of seven-point scales. The concept to be rated is presented at the top of the combined scale. Students register their reaction to the word by making a mark closer to the adjective on each line that indicates the strength of their feeling toward the concept. Their reactions can be treated statistically by summing and averaging the numerical value of their responses.

The instrument used was constructed according to the criteria on scale construction from an accepted authority, Isaac's Handbook in Research and Evaluation (6). The adjectives for this project were chosen from the Osgood (8) list of recommended adjectives, which have been extensively tested for factor loading and reliability. A copy of the semantic differential is included in Appendix C.

Cognitive Pretest

The pretest administered on the first day of the semester was the revised Test of Understanding in College
Economics, Micro Form A (4, p. 29), a comprehensive thirty-item multiple-choice examination designed to be completed in forty-five minutes. A copy of the TUCE form used in this research is provided in Appendix D. The TUCE revision, like the original, was a joint effort of the Joint Council on Economic Education and the American Economic Association Standing Committee on Economic Education. The test, prepared for use at the university level, is designed to be used as a pretest or a posttest.

Statistical norming data prepared for the revised TUCE compute the Kuder-Richardson reliability coefficient for Micro Form A, when given as a pretest, to be .54. The reliability coefficient for Micro Form A given as a posttest is .74 (4, p. 20). Evaluation of the TUCE responses in this study, using the Statistical Package for the Social Sciences (5) program, Alpha Model, yielded a .62 alpha rating.

**Cognitive Posttests**

Because of the difficulty of assigning questions from the TUCE to specific modules, which would have been necessary with the experimental design used, the TUCE was not used as a posttest. The posttests for Weatherford classes, Modules 1 through 4, were prepared by the author of this research. Test banks from several texts (2, 11, 13), primarily Albrecht Economics (1), the Weatherford College text, were used. Test questions were based on concepts that had been covered in the
course text as well as in the coordinating filmstrip. Post-tests on Modules 5 through 8 for the Weatherford classes and Modules 1-8 for North Texas State University were taken from Introduction to Economics, Unit I, Microeconomics, Instructor's Guide (7). The test questions in this manual were selected by the authors to cover the concepts presented in all major texts. The validity of the tests was verified by five economic instructors.

The reliability of the posttest instruments in this study was also evaluated using the SPSS program for reliability. The posttest instruments used in the Weatherford classes received an alpha rating of .8577, and those at North Texas State University rated .87464.

Data Processing

All instruments used to gather data from the students were submitted to the computing center at North Texas State University for keypunching. The punched cards were then entered into the disk files to be accessible for analytical procedures, using the Statistical Package for the Social Sciences (SPSS) process on the interactive computer arrangement, a National Advance Systems 5000. Each test question was entered as a separate variable to facilitate a greater variety of analytical procedures.
Data Analysis

The basic data analytical technique used was simultaneous univariate linear multiple regression with the experimental control variable, viewing of the filmstrip, entered last in the regression. Stepwise entry was specified to provide incremental data.

Methodological Assumptions and Weaknesses

Several research strengths emerged during the development of this study. Initially, the author's not being the administrator and instructor of the experiment was considered a shortcoming; however, this factor emerged as a strength of the study. As mentioned in the survey of the literature, individuals who conduct their own experiment frequently invest substantially more time, in which case benefits attributable to the experiment are in fact returns to faculty effort (9, p. 955).

Many studies in economics education have been criticized for being one-school, one-time experiments. This study, although not large enough to encompass multiple campuses, did involve two campuses of varying size, a fact which added strength to the research.

Another criticism aimed at studies which evaluate instructional techniques is that the level of input is not held constant (9, p. 926). The design of this project defeated such
a threat. The filmstrips were shown in the classroom; therefore, the amount of input was held constant. All classes were allotted essentially the same amount of instruction time; that is, when an instructor showed a filmstrip, he relinquished corresponding lecture time.

Measurements which contain too few values, for example course grades A through F, also threaten the validity of research projects (9, p. 956). The design of this study, which evaluates each test score on a percentage basis, gives a much more accurate degree of gradation for evaluation purposes.

One of the weaknesses of the research was the fact that the posttests did not count toward the student's semester course grade. As indicated in the review of the literature, other things constant, having the test score count in determining the course grade was positively and significantly associated with a difference of over twelve points in the posttest score (12, p. 39). Again, the experimental design helped exacerbate this weakness in that each student was completing posttests for both control and experimental situations. Unannounced posttests emerged as a plus for the project. Announced posttests would have measured the results of out-of-class study time.

The TUCE pretest was given at the beginning of the semester to avoid sensitizing students. For the same reason, pretests at the beginning of each module were avoided.
The design chosen, which enabled each group at different times to be both experimental and control, further protected the research from pretest sensitizing as well as other internal threats. Even though there was a difference in teacher experience and the student load was significantly different, this was not a cause for serious concern, since each instructor taught both an experimental and a control class. Furthermore, the research was protected from student differences in aptitude and maturity, as well as undefined differences, in that each student was part of the experimental group on four filmstrips and part of the control group on the remaining four filmstrips. In a sense, the experiment identified 150 students and "cloned" seven additional, identical students for each student in the first group. Of those eight "identical students," four were in a control group and four in an experimental group. There are some who would contend justifiably that no demographic variables need to be provided—the very design of the project equalizes student differences by simulating a "matched-pair" technique.
CHAPTER BIBLIOGRAPHY


CHAPTER III

FINDINGS

The study tested two major hypotheses:

1) Hypothesis I asserts that viewing of the Luker-Martin filmstrips, Introduction to Economics, Unit I, Microeconomics, will result in measurable cognitive gains for students.

2) Hypothesis II states that students who respond with positive attitudes toward the filmstrips will register greater cognitive gains than those students who register less favorable attitudes toward the filmstrips.

The data generated in the regression are presented in Table I on the following page. The $MR^2$ of .25878 indicates that the model explains 25.878 percent of the variation in test scores, and the tabled F indicates that the model is statistically significant at the .001 level.

Five variables were statistically significant. Difficulty registered a simultaneous B of -6.04336 and Beta of -.3976. As the difficulty index assigned a module increases by one, the test score decreases by approximately 6.04 percentage points, all other factors being equal. The incremental $R^2$ indicates that the variable Difficulty explains
### TABLE I

**REGRESSION: SUMMARY OF A STEPWISE REGRESSION OF SELECTED INDEPENDENT VARIABLES ON COGNITION**

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--- Variables Not Significant ---

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Constant = 37.81071

Adjusted R² = .25466

DF = 5

F = 62.704

Signif. = .001
approximately 15.77 percent of the variation in test scores; PR\(^2\) of 0.175469 tells us that the Difficulty index accounts for 17.54 percent of the variation after the effect of the other variables is partialed out.

Grade-Point Average earned a B of 4.85952 and Beta of 0.19475, also significant at the .001 level. The student's self-reported GPA was positively related to test scores. As the GPA increased by one, the test score tended to increase 4.85952 points. Incremental R\(^2\) indicates that GPA explains approximately 4.5 percent of the variation in posttest scores. The PR\(^2\) of 0.057832 indicates that the fully partialed effect of GPA increases to 5.7 percent.

The variable Pretest earned a B of 0.322232 and Beta of 0.14946. As Pretest score increased by one point, the test score increased approximately 0.32. Incremental R\(^2\) suggests that Pretest could predict 2.37 percent of the variation in test scores. With the effect of the other variables partialed out, Pretest predicts 3.09 percent of the variation.

Gender is positively related to posttest scores. Males averaged 2.67635 points higher than females, all other factors being equal. Gender's power of prediction is estimated at 3.63 percent (R\(^2\) of 0.00363) of total test variation, or 4.886 percent of unexplained variation (PR\(^2\) = 0.004836). Gender is significant only to the .05 level (Signif. = 0.0359).
The critical independent variable, View, obtained a B of 7.21423 and Beta of .16796. Significant to the .001 level, these calculations indicated that viewing of the module was positively related to posttest scores. Viewing the filmstrip module tended to increase test scores approximately 7.2 percentage points, all other factors held constant. Incremental $R^2$ indicated that View explained 2.821 percent of the variation in test scores; the fully partialed coefficient of correlation ($PR^2$) increased the predictive power of View to 3.666 percent of unexplained variation.

Insignificant variables included Missing/Actual Pretest Scores, School, Classification, Previous Hours in Economics, Place of Birth, and Inter*PFI.

Hypothesis I is therefore accepted as analytically and statistically significant.

Hypothesis II is rejected. The interaction of Pre-experiment Attitude Toward Filmstrips and Viewing the Filmstrip failed to produce statistically significant results.
CHAPTER IV

SUMMARY, FINDINGS, CONCLUSIONS, INFERENCES, AND RECOMMENDATIONS

Summary

This research project examined the effectiveness and efficiency of a set of eight filmstrips, Introduction to Microeconomics, Unit I, Microeconomics, used as a supplement to a traditional lecture approach in an introductory course on principles of economics.

A modified Campbell Stanley (2) equivalent time series design was employed. Two instructors from two colleges participated, with each teaching two classes. Each of the four classes at varying times was both an experimental and a control group. One class for each instructor was randomly assigned four modules for viewing, while the second section viewed the remaining four modules.

The course material was divided into eight logical units with the filmstrips coordinated with the text material. Both groups heard the appropriate lectures for one unit. The coordinated filmstrip was shown to the experimental group, which relinquished corresponding lecture time. The instructor then administered the posttest to both the control and the experimental groups. The same procedure was followed for each
module, yielding 1200 cases (eight posttests for each of 150 students).

Student demographics collected defined gender, school, grade-point average, classification, previous hours attempted or completed in economics, and place of birth. Pretest Scores represented the results of the Micro Form A of the TUCE (4), administered at the beginning of the semester. The variable Difficulty was created to equalize the variation in the test scores attributable to the inherent difficulty of concepts in each module. Missing or Actual Data Points on Pretest Scores tested the significance of missing pretests. A semantic differential evaluated the student's pre-experiment attitude toward filmstrips. The resulting pre-experimental attitude was interacted with the critical variable, View, to create Inter*PFI. The critical independent variable, View, indicated whether the dependent variable, the cognitive posttest score, had been influenced by student viewing of a coordinating filmstrip. These variables were regressed on the cognitive posttest scores.

Findings

Hypothesis I, which stated that viewing of the filmstrip series as a supplement to the traditional classroom lecture would result in significant, measurable cognitive gains for students, was found to be statistically significant at the .001 level. The main effect for the critical independent
variable, View, was positive. Other factors being constant, students who viewed the filmstrip scored 7.2 percentage points higher than students who did not view the filmstrip. The computed MR² indicated that the model explains 25.878 percent of the variation in test scores.

Hypothesis II asserted that students with positive attitudes toward filmstrips would experience greater cognitive gains, as measured on posttest scores, than students with negative attitudes toward filmstrips. The resulting analysis indicated that the interaction of pre-experiment attitudes with viewing of the filmstrip was insignificant; therefore, no relationship was discovered in the designed research, and the hypothesis failed.

Conclusions

Based on the data which were gathered from microeconomics classes at North Texas State University and Weatherford College, viewing of the filmstrip increased student cognition. A favorable positive attitude toward filmstrips could not be associated with higher test scores in the set of data analyzed.

Inferences

While the sample was limited to teachers in two schools, there is some ceterus parabus rationale for a wider generalization of the findings. There is no fundamental reason
to assume that these two teachers and two schools are significantly different from similar schools and similar teachers elsewhere. If this is true, then the findings are indeed generalizable to these types of institutions.

Recommendations

If the hypotheses tested here are to be generalizable to other groups, the project must be replicated using other teachers, schools, and students. Furthermore, if the results are to be generalizable to filmstrips in general, then other filmstrips should be tested.

The design of this research examined the filmstrips only as a supplement to the traditional lecture approach. The filmstrips also should be evaluated when used on an individual basis.

Further attempts should be made to identify groups of students who might benefit proportionately more than others from viewing the filmstrips. More interaction variables should be included in the model, or the researcher could estimate the relationships for various groups of students and test for significance. Also, more attention should be given to defining groups which might benefit differentially.

The effectiveness of each of the eight filmstrips should be analyzed independently. The existing data set could be used for such an analysis. The experiment would then need to be replicated with other data sets for generalizability.
Several attitude measurements taken in this study which were not incorporated in the analysis could provide additional analytical possibilities with the existing data set. All outputs are not necessarily cognitive. For instance, a desirable effect might be improved attitudes. The existing measurements could be the basis for identifying changes in attitudes related to the filmstrips.

Future research which addresses these questions should be conducted.
CHAPTER BIBLIOGRAPHY


APPENDIX A

STUDY VARIABLES
TABLE II
DESCRIPTION AND FREQUENCIES OF VARIABLES USED IN REGRESSION

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TABLE III
MEANS AND STANDARD DEVIATIONS OF VARIABLES
USED IN REGRESSION

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DIFFICULTY INDEX*

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<tr>
<td>VIII</td>
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*Prepared by a panel of experts based on their teaching experience.

**Scale: Least Difficult = 1; Most Difficult = 5
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TABLE VI

CORRELATION OF FILMSTRIP MODULES WITH SPENCER'S CONTEMPORARY MICROECONOMICS*

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<td>Semantic Differential Researcher Prepared⁶,⁷</td>
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³James J. Willis and Martin L. Primack, Explorations in Economics, Test Bank (Boston, 1977).


**TABLE VIII**

RELIABILITY AND VALIDITY OF TEST INSTRUMENTS

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<th>Variable</th>
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*Test questions from standardized test banks, evaluated by panel of experts for validity.


***Semantic differential adjectives tested and recommended by Osgood.
APPENDIX C

STUDENT DATA
STUDENT INFORMATION

PLEASE COMPLETE THE FOLLOWING INFORMATION. Print your name legibly. Circle the appropriate response on Numbers 3 through 8. Use the blank in Number 9 to supply any additional information to Number 8 which you think might be helpful.

1. Name___________________________________________________________

2. Social Security Number ___________________________________________

3. School:  (1) North Texas State University
*(2) Weatherford College

4. Section:  (1) MW 9:25;  (2) TT 9:25;
(3) MWF 9:00;  (4) MWF 11:00

5. Gender:  (1) Male *(2) Female

6. Estimated Grade Point Average
(1) Below 1.0;  (2) 1.0--1.9;  (3) 2.0--2.9;
(3) 3.0--3.9;  (4) 4.0

7. Classification
(1) Freshman;  (2) Sophomore;  (3) Junior;
(4) Senior  (5) Graduate

8. Previous hours completed or attempted in economics?
(1) 0;  (2) 3;  (3) 6;  (4) More than 6

9. Comments (passed, failed, dropped, grade in other economics courses; repeating to improve grade)? ______________________________________________________________

10. Place of Birth:  (1) U.S.  (2) Other

*Recoded 0 in regression analysis.
ATTITUDE EVALUATION

INSTRUCTIONS: Rate the word written in all capital letters according to how you perceive it or feel toward it at the moment by circling a number somewhere along the 7-point scale between the two adjectives.

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APPENDIX D

TEST INSTRUMENTS
EVALUATING YOUR KNOWLEDGE OF ECONOMICS

You will be given 45 minutes to answer the following 30 questions on basic micro economics. Because you are enrolled in a basic introductory course in economics, you may never have had a previous course in economics.

These questions are designed to survey your knowledge of economics. The results of this questionnaire will not affect your grade in the course. Your cooperation, however, will enable your instructor to make the course more meaningful for you.

Read the questions carefully and select what you think is the correct or best answer. Please attempt to answer all the questions.

Circle the number in front of the answer you select.

You may begin when your instructor tells you to start.
1. Which of the following questions provides the best analogy to the basic economizing problem confronting any nation?
   *1) Shall cars or tractors be produced in a given plant?
   2) How can the number of cars produced in a given plant be increased?
   3) What are the steel requirements for producing a specific type of tractor?
   4) How many workers are required, on a particular assembly line, to produce 100 cars a week?

QUESTIONS 2 AND 3 ARE BASED ON THE FOLLOWING INFORMATION:

In an economy where there is unrestricted competition in all markets, coal is the primary source of heat for most households, and is produced in roughly equal amounts in all parts of the country. Suppose a supply of natural gas which can provide heat at a much lower cost is discovered.

2. What is the most likely effect of the natural gas discovery on the price of coal and the quantity of coal produced?

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<tr>
<th>Price</th>
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<tr>
<td>*2) decrease</td>
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<td>3) increase</td>
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</tr>
<tr>
<td>4) decrease</td>
<td>increase</td>
</tr>
</tbody>
</table>

3. Which of the following changes in the distribution of real income will most likely result from the natural gas discovery?

   I. The total real income of coal miners will fall relative to the average.
   II. The total real income of residents in colder districts will rise relative to the average.

   1) I only
   2) II only
   *3) both I and II
   4) neither I nor II
4. How does the presence of a monopoly in an otherwise competitive full-employment economy tend to affect output of monopoly and competitive products?
   1) The output of both is too large.
   2) The output of both is too small.
   3) The output of the monopoly products is too large, and the output of the competitive products is too small.
   *4) The output of the monopoly products is too small, and the output of the competitive products is too large.

5. A student, in estimating the costs of her senior year at the university, proves her expertise as an economist by correctly including all the opportunity costs of her education. The items on her list include all but one of the following. Which one is NOT included:
   *1) meals
   2) tuition and fees
   3) books and supplies
   4) income from job given up

6. According to the U.S. Postmaster General, "Unless increased public funding enables us in the near term to slacken the pace of rate increases, we may be caught in a vicious cycle of rate increases to compensate for volume decreases brought on by rate increases." Which of the following is the most likely economic explanation of this situation?
   1) The "vicious cycle" is an insoluble problem because quantity demanded always falls with a rise in price.
   2) There is no real "vicious cycle", once the Post Office increases its rates enough, it will increase its revenues.
   *3) There is a "vicious cycle" because the Post Office is in the elastic portion of the demand curve; to increase revenue it should lower rates.
   4) There is a "vicious cycle" because the Post Office is in the inelastic portion of the demand curve; to increase revenue it should lower rates.

7. Some people hold that our capacity to destroy the cities of any potential enemy is a necessary condition for keeping the peace, but that the capacity to do it three rather than two times over adds little or nothing to our national security. In economic terms, these people are saying that for America's deterrents:
   1) both the marginal and total utilities are low.
   2) both the marginal and total utilities are high.
   3) the marginal utility is high, although the total utility is low.
   *4) the marginal utility is low, although the total utility is high.
8. An example of "internalizing" and "externality" occurs when:
   I. a city government taxes a private firm for dumping waste into a public lake.
   II. a city government subsidizes neighborhood improvements made by individual citizens.
   1) I only
   2) II only
   *3) both I and II
   4) neither I nor II

9. There has necessarily been a change in the market demand schedule of a commodity if:
   1) the production of the commodity has increased.
   *2) more of the commodity can be sold at the same price.
   3) the commodity sells at a higher price than previously.
   4) less of the commodity is being purchased than previously.

10. If a national system of free medical care for the aged poor is established, and the system is paid for by an increase in the income tax, these actions would promote one economic goal, but work against another. Specifically, these actions would be most likely to:
   *1) promote equality but reduce freedom.
   2) promote growth but reduce stability.
   3) promote efficiency but reduce equality.
   4) promote efficiency but reduce security.

11. If a firm finds that its marginal revenue exceeds its marginal cost, the maximum profit rule requires the firm to:
   *1) increase its output in both perfect and imperfect competition.
   2) decrease its output in both perfect and imperfect competition.
   3) increase its output in perfect, but not necessarily in imperfect, competition.
   4) increase its output in imperfect, but not necessarily in perfect, competition.

12. In 1968, a man worked as a civil engineer for a construction firm at $8,000 per year until he was drafted into the Army. His Army pay plus dependents allowance was $4,000 per year.
   Is $8,000 or $4,000 per year the better measure of the cost to society of the man's service in the Army in 1968? Why?
1) $4,000, because this is what he was paid for his Army service.
*2) $8,000, because this would have been the value to society of his labors if he were not in the Army.
3) $4,000, because this was the amount of goods taxpayers had to give up to pay the taxes the government needed to pay him.
4) $8,000, because he paid less federal income tax while he was in the Army than he would have paid had he remained in civilian life.

13. The table below gives the number of tons of coal and steel that can be produced in Country A and Country B by using the same resource input (i.e., the same amount of labor, capital, and natural resources in both countries).

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<thead>
<tr>
<th></th>
<th>Coal</th>
<th>Steel</th>
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<tr>
<td>Country A</td>
<td>10 tons</td>
<td>10 tons</td>
</tr>
<tr>
<td>Country B</td>
<td>8 tons</td>
<td>4 tons</td>
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If these were the only two countries and the only two commodities, and if these costs remain unchanged, Country B would find it advantageous to:
1) import both coal and steel.
2) export both coal and steel.
3) import coal and export steel.
*4) export coal and import steel.

14. In a market economy, which of the following would determine how the factors of production are to be allocated?
1) social custom
*2) the ways incomes are spent
3) the exchange value of money
4) the needs of the managerial class

15. "Deregulating the trucking industry is not the same as deregulating the airlines. Airlines have an expandable market—you lower rates and more people will travel. Trucking is different—if somebody has a thousand pieces to ship, he's not going to ship any more just because the rates are lowered."

Which of the following economic principles cast doubt on the part of the quotation dealing with the trucking industry?
1) comparative advantage
*2) downward sloping demand
3) increasing marginal cost
4) price elasticity of supply
16. The Soviet constitution proclaims that no charge shall be made for use of water resources.
   1) This is efficient since water is a free good provided at no cost by nature.
   *2) This is inefficient whenever using water for one purpose prevents its use for another purpose.
   3) This is an interesting difference from capitalism, but has no economic significance under socialism.
   4) This will increase the satisfaction the Russian people can get from their limited resources since it will make goods like electricity and cotton, that are produced with water, cheaper.

17. In the early 1970's, the federal government proposed that new and stricter standards be established for sulphur dioxide emissions. Since burning coal produces large amounts of sulphur dioxide, these new standards would have especially affected coal burning firms. The president of the United Mine Workers protested the proposed standards on the grounds that they would "drive public utilities and other firms that burn large amounts of coal to nuclear reactors." This suggests that:
   *1) coal was a cheap fuel partly because users could avoid some of the cost of burning it.
   2) government intervention would have concealed the true economic advantages of cheap coal.
   3) the sulphur dioxide standards, while well intended, were too strict to be economically practical.
   4) miners would have preferred a tax on the use of coal rather than the sulphur dioxide standards.

18. If a firm faces a demand curve that slopes downward to the right, we can reasonably expect that:
   1) the firm must lower prices if it hopes to increase its profits.
   2) the firm will have no effect on the price of the product it sells.
   *3) the firm will find that its marginal revenue is less than the price of the product it sells.
   4) the firm will find that its marginal revenue is greater than the price of the product it sells.

19. Although statistical data show that broadcasting revenues exceed the profits of most professional sports teams, thus suggesting that these teams could not operate profitably without broadcasting revenues, an economist concluded that this overstates the importance of broadcasting for team owners' profits. How can the concept of economic rent be used to explain this conclusion?
1) If there were no broadcasting, team owners would not have to rent TV lines, and their costs would be lower.
2) If the owners had to pay economic rent to players, they could never make a profit without broadcasting revenues.
*3) If there were no broadcasting revenues, players' salaries would not include as much economic rent, and the team owners' costs would be lower.
4) Without broadcasting, owners could operate as monopolies instead of competitors and collect enough economic rent to overcome the loss of TV revenue.

QUESTIONS 20 AND 21 ARE BASED ON THE FOLLOWING INFORMATION:

Smog in the Central City area is largely caused by automobile exhaust fumes. The smog problem could be virtually eliminated if approximately 100 air-purification plants were built in the area. These plants would simply draw in smog-filled air, remove the smog, and pump the clean air back into the Central City atmosphere. It is estimated that the cost of operating each plant would be $10,000 per year.

20. It is highly unlikely that private business firms would build and operate the plants and sell their services directly to individual residents of the Central City area because:
   1) the cost of operating the plants would be too great.
   2) no individuals would be willing to pay for smog-free air.
   3) it would be less costly for the government to build and operate the plants than for private business firms to do so.
   *4) it would probably be impossible to provide smog-free air to those who are willing to pay for it while withholding it from those who refuse to pay.

21. Suppose that the government of Central City were to build and operate the air-purification plants. From the standpoint of achieving efficiency in the allocation of economic resources, which of the following taxes should be increased to provide the additional tax revenues needed to finance the operation of the air-purification plants?
   1) income
   2) property
   3) general sales
   *4) motor vehicle fuel
22. In June 1978, a driver who wished to buy gasoline and also have her car washed found that when she bought 11 gallons of gasoline at 88 cents per gallon, the car wash costs 75 cents, but that if she bought 12 gallons of gasoline, the car wash was free. For this driver, therefore, the marginal cost of the twelfth gallon of gasoline was:
1) zero.
*2) 13 cents.
3) 75 cents.
4) 88 cents.

23. Assume that the United Steel Workers succeed in raising wages in the steel industry. Under which of the following conditions, if any, will employment in the steel industry drop substantially (other things being equal)?
1) Management increases prices, and the demand is inelastic.
2) Labor costs is a relatively small percentage of the final cost of steel.
3) There are few technical possibilities for substituting capital for labor.
*4) None of the above is likely to cause a substantial decline of employment in the steel industry.

24. From the standpoint of economic efficiency, an unregulated private market system tends to:
1) produce excessive amounts of public as distinct from private goods.
*2) produce excessive amounts of goods which have substantial external costs.
3) produce excessive amounts of goods which have substantial external benefits.
4) produce the right amounts of goods and services without government intervention.

25. "A striking and for some reason almost unknown fact about the American Telephone and Telegraph Company is that its earnings have often gone up whenever the government has ordered its prices down."

Below are listed four possible combinations of price elasticity of demand and marginal cost (relative to average cost) for telephone and telegraph services. Which of the four would, if true, best explain the "almost unknown fact" stated in the quotation?
*1) elastic demand, low marginal cost
2) inelastic demand, low marginal cost
3) elastic demand, high marginal cost
4) inelastic demand, high marginal cost
26. A family will be away from its house for six months. The monthly mortgage payment on the house is $300. The local utility services, to be paid by the owner, and an allowance for "wear and tear" cost $100 per month if the house is occupied; otherwise 0. If the family wishes to minimize its losses (or maximize its gains) on the house while it is away, it should rent for as much as the market will bear so long as monthly rent is above.

1) $ 0.
2) $100.
3) $300.
4) $400.

27. In travelling about a city most people can use either a subway or a bus (they are substitutes). Suppose all subway fares were doubled, while bus fares remained unchanged. How would total fare revenue be affected by the subway fare increase?

1) increase for both subways and buses.
2) decrease for both subways and buses.
*3) increase for buses but might increase or decrease for subways.
4) increase for subways but might increase or decrease for buses.

28. "During the first year that the Salk vaccine for infantile paralysis became available, the quantity produced was too small to inoculate all those in susceptible age groups. Although the cost of production and the price were not particularly high, production could not be expanded rapidly enough to meet the quantity demanded. The government therefore intervened to regulate its distribution."

What does the information in the quotation suggest about the price of Salk vaccine during the first year it was available?

1) It was at equilibrium.
2) It was above equilibrium.
*3) It was below equilibrium.
4) The relation to equilibrium cannot be determined from the information given.

29. "The bigger the volume, the lower the cost; that is the first law of all industry." Which of the following best describes this quotation?
1) The quotation correctly states one of the laws of economics.
2) Although not a scientific law, the statement embodies a well-established generalization applying to most products, but not to all of them.
3) Although true for a limited number of products, the statement is not generally correct.
*4) Although true up to a point for virtually all products, the statement is inconsistent with a well-established finding of economics.

30. In "tight" housing markets, rent controls are often enacted to hold the price of housing to a "reasonable" level. How does this policy affect the relative gains of tenants and landlords, and the allocative function of prices?
*1) It prevents landlords from gaining at the expense of tenants; the allocative function of prices is impaired.
2) It prevents landlords from gaining at the expense of tenants; the allocative function of prices is not impaired.
3) It prevents tenants from gaining at the expense of landlords; the allocative function of prices is impaired.
4) It prevents tenants from gaining at the expense of landlords; the allocative function of prices is not impaired.

*Correct response.
MODULE I

(Posttest for Weatherford College)

1. The concept of scarcity is applicable to
   1) only underdeveloped countries
   2) those countries that do not have supplies of all
      natural resources
   3) individuals, but not to countries
   4) all countries and/or groups of individuals

2. The necessity of choice is due to the fact that
   1) so many things are available that we don't have
      time to use all of them.
   2) we get tired of some things and must choose
      others to replace them.
   3) we have only limited resources to produce the
      unlimited products and services demanded.
   4) people like to select different items.

3. The value of what you give up to attend a lecture
   on economics is
   1) estimated to be greater than the value of the lecture
   2) unable to be ascertained because it was never
      experienced.
   3) the opportunity cost of attending the lecture.
   4) the price of the lecture.

4. According to Table 1-1, the opportunity cost of increasing
   the production of combines from 1,000 to 2,000 units is
   1) 1,000 automobiles
   2) 2,000 automobiles
   3) 3,000 automobiles
   4) 4,000 automobiles

   Table 1-1
   Production-Possibilities Schedule

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<td>D</td>
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<tr>
<td>E</td>
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</table>
5. Which of the following would cause an outward shift of the production-possibilities frontier?
1) a decrease in the unemployment rate
2) a decrease in the rate of inflation
3) the development of a less expensive method of making nuclear weapons
4) a shift of resources from making trucks to making cars

6. If an economy is operating at a level of output to the left (below) the maximum trade-off (production possibilities) curve, the output foregone:
1) can never be recovered
2) must be recovered
3) can easily be recovered
4) should not be recovered

7. If an economy is operating at a point inside of the production possibilities curve
1) not all of society's resources are being utilized
2) the curve will move to the left
3) economic policy must slow down the further growth of the economy
4) society's resources are being used to produce too many consumer goods thus slowing economic growth

8. In Exhibit 1-1, full employment is shown by choice(s)
1) C  2) A and B  3) A and D  4) B and C
9. A society can be at a point outside its production possibilities curve
   1) if all resources are properly utilized
   2) if unemployment is eliminated
   3) both of the above
   4) never

10. The production possibilities curve
   1) is always a straight line
   2) could never be a straight line
   3) is always bowed in toward the origin
   4) is generally bowed away from the origin

INSTRUCTIONS: RATE the word written in all capital letters according to how you perceive it or feel toward it at the moment by circling a number somewhere along the 7-point scale between the two adjectives.

CORRECT ANSWERS: (1) 4; (2) 3; (3) 3; (4) 4; (5) 3;
                  (6) 1; (7) 1; (8) 2; (9) 4; (10) 4
1. The best example of an entrepreneur is
   1) a popular entertainer
   2) an automobile mechanic
   3) a U.S. Congressman
   4) the owner and operator of a retail store

2. An automobile is
   1) a capital good to a traveling salesman
   2) a consumer good to a family on vacation
   3) a capital good to Hertz Rental Company
   4) all of the above

3. The law of demand states that
   1) the quantity demanded varies directly with the price
      of a product
   2) the quantity demanded varies inversely with the
      price of a product
   3) as the price goes down, the quantity goes down
   4) as the price goes up, the quantity goes up

4. In a market economy, the key to the efficient use of
   scarce resources is
   1) industry cooperation
   2) competition
   3) collective decision making
   4) consumer demand

5. The set of policies used to keep markets competitive is
   known as
   1) fiscal policy
   2) monetary policy
   3) antitrust policy
   4) regulatory policy

6. Monetary policy refers to
   1) government spending and taxes
   2) government regulation of the money supply and
      interest rates
   3) consumer protection laws
   4) penalties for counterfeiting
7. A Market Economy requires a government that is
   1) strong
   2) neutral
   3) weak
   4) dominant

8. Which of the following cause(s) market failure?
   1) public goods
   2) externalities
   3) monopoly
   4) all of the above

9. Money flows in an economy are valuable because
   1) money has a value in itself
   2) the flows facilitate real flows
   3) everyone likes to accumulate money
   4) they stabilize the price of gold

10. When the government imposes quotes that reduce the amount
    of beef imported, the price of beef will
    1) decrease, and the quantity sold will increase
    2) decrease, and the quantity sold will decrease
    3) increase, and the quantity sold will decrease
    4) increase, and the quantity sold may increase,
        decrease, or remain the same

Correct answers: (1) 4; (2) 4; (3) 2; (4) 2; (5) 3;
                 (6) 2; (7) 1; (8) 4; (9) 2; (10) 3.

INSTRUCTIONS: RATE the word written in all capital letters
according to how you perceive it or feel toward it at the
moment by circling a number somewhere along the 7-point
scale between the two adjectives.

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1. The extra satisfaction received from possessing one more unit of an item is called
   1) average utility
   2) marginal satisfaction
   3) marginal utility
   4) market utility

2. When supply equals demand the market has reached
   1) equilibrium
   2) saturation
   3) a ceiling
   4) elasticity

3. The supply curve demonstrates the law of supply which states
   1) as the selling price of a product increases, larger quantities are placed on the market
   2) as the selling price of a product decreases, larger quantities are placed on the market
   3) as the selling price of a product increases, smaller quantities are placed on the market
   4) none of the above

4. The additional cost a firm must incur to produce one more item is called
   1) variable cost
   2) marginal cost
   3) mass production cost
   4) seller's cost

5. Price is determined by
   1) supply of units
   2) total utility of units purchased
   3) marginal utility of the last unit purchased
   4) marginal utility of total units

6. The more abundant goods become, the
   1) higher their price
   2) greater the consumer surplus
   3) greater the marginal utility
   4) greater the total utility
Cost Schedule of a Firm

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</table>

7. In the table above, the average cost of producing 3 units is
   1) less than $5
   2) more than $9
   3) $8
   4) more than $5

8. In the preceding table, the average variable cost of producing 3 units is
   1) less than $3
   2) $4
   3) less than $4
   4) $5

9. In the table above, the marginal cost of producing the second unit is
   1) $4
   2) $3
   3) $9
   4) $7

10. Which of the following is not a fixed cost of production?
    1) wages
    2) insurance
    3) property taxes
    4) rent

CORRECT ANSWERS: (1) 3; (2) 1; (3) 1; (4) 2; (5) 3; (6) 2; (7) 4; (8) 3; (9) 2; (10) 1
1. Which of the following factors does NOT affect the demand curve for beef?
   1) gasoline prices
   2) the price of chicken
   3) the cost of electricity
   4) the price of beef

2. When there is a shift in the entire demand curve, the result is
   1) higher prices
   2) lower prices
   3) a new equilibrium price
   4) no price change

3. When government sets prices below their equilibrium levels,
   1) shortages develop
   2) surpluses develop
   3) profits increase
   4) demand increases

4. If a producer finds that demand for his product is inelastic, he would be well advised to
   1) lower his prices
   2) raise his prices
   3) keep his prices the same
   4) go out of business

5. In relation to price and demand, elasticity means
   1) the buyer's response is relatively smaller than the change in price
   2) the buyer's response is the same as the change in price
   3) the buyer's response is relatively greater than the change in price
   4) the buyer does not respond at all

6. Important factors of elasticity or inelasticity are
   1) essentiality of the good.
   2) availability of substitutes
   3) time
   4) all of the above
7. When the price elasticity of demand is elastic
   1) a cut in price results in an increase in total revenue
   2) an increase in price results in an increase in total revenue
   3) a change in price results in no change in total revenue
   4) none of the above

8. When the price elasticity of demand is unitary
   1) a cut in price results in an increase in total revenue
   2) an increase in price results in an increase in total revenue
   3) a change in price results in no change in total revenue
   4) none of the above

9. In a competitive market, the price of a good determines:
   1) the quantities that sellers make available
   2) the quantities that buyers purchase
   3) both (1) and (2)
   4) shifts of its market demand curve
   5) Shifts of its market supply curve

10. If the demand curve for product G is downward-sloping, this means that an increase in the price of G will result in:
  1) an increase in the demand for G
  2) a decrease in the demand for G
  3) no change in the quantity demanded of G
  4) a larger quantity of G demanded
  5) a smaller quantity of G demanded

CORRECT ANSWERS: (1) 4; (2) 3; (3) 1; (4) 2; (5) 3; (6) 4; (7) 1; (8) 3; (9) 3; (10) 5.

INSTRUCTIONS: RATE the word written in all capital letters according to how you perceive it or feel toward it at the moment by circling a number somewhere along the 7-point scale between the two adjectives.

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</table>
1. The concept of choosing to maximize one's own welfare is called:
   1) economizing
   2) proselytizing
   3) focusing
   4) none of the above are correct

2. The extra satisfaction received from possessing one more unit of an item is called:
   1) average utility
   2) economizing utility
   3) utility
   4) marginal utility

3. In order for a good or service to be considered scarce, it must be:
   1) in limited supply
   2) wanted by someone
   3) the conditions in both A and B must apply
   4) none of the above are correct

4. Study the above trade-off curve:
If the economic system represented in this graph chooses to produce 40,000 units of consumer products, it must limit production of environmental products to:
1) 20,000
2) zero
3) 50,000
4) 10,000

5. Study the preceding graph:
If the economic system represented in this graph chooses to produce an additional 10,000 units of consumer and environmental products at Point B, it must:
1) print more money
2) add more factors of production such as labor, raw materials, and/or equipment
3) increase the efficiency of existing factors of production
4) responses B and C are both correct

6. The opportunity cost of a new highway is:
1) the money cost of building the highway
2) the budget deficit created by financing the cost of building the highway
3) postponing until later the decision whether to build the highway
4) other desirable goods and/or services that must be given up in order to build the highway

7. Which of the following assumptions does not involve the trade-off curve?
1) the stock of resources is fixed at any given moment in time
2) resources can be used to produce any type of good
3) if all resources are used to produce one type of good, the output of the other type is zero
4) there is an unlimited supply of labor

8. The concept of opportunity costs is sometimes called the "no free lunch" principle to stress that:
1) food prices have been recently rising
2) the cost of obtaining more of one good is measured by the benefits received
3) environmental goods are more important than consumer goods
4) more of something usually means less of something else
9. If an economy is currently operating at a level of output to the left of (below) the maximum trade-off curve, it:
   1) can produce more of one good only by giving up some of another
   2) can produce more of all goods
   3) must give up increasing amounts of one good to obtain more of another
   4) none of the above are correct

10. The subject of mainstream economics is:
   1) cartography
   2) model building
   3) socialism
   4) the economizing aspect of human behavior

CORRECT ANSWERS: (1) 3; (2) 4; (3) 4; (4) 4; (5) 1; (6) 4; (7) 4; (8) 4; (9) 2; (10) 4
MODULE II

(Posttest for North Texas State University)

1. In a simple, two-sector circular flow model of a Market economy, the production unit:
   1) is the ultimate recipient of the goods and services produced
   2) transfers labor and property for income
   3) transfers goods and services for consumer expenditures
   4) serves as the government

2. In a Market economy, production occurs as a result of:
   1) government decisions
   2) traditional custom and usage
   3) work activities of the consumption unit induced by income payments
   4) low prices

3. In a Market economy, the production and distribution of output is determined by:
   1) government decisions
   2) traditional custom and usage
   3) the income and tastes of consumption units interacting with product prices
   4) high prices

4. In a Market economy, production and distribution are coordinated by:
   1) government agencies
   2) traditional custom and usage
   3) price signals
   4) the public good

5. Which of the following is NOT a proper function of government in a Market economy?
   1) to make the "rules of the game", adjudicate disputes, and protect property rights
   2) to organize and carry out production and distribution
   3) to maintain competition and alleviate market inefficiencies
   4) to provide a stable currency
6. The major resources (factors of production) of any economy are land, labor, and capital. Which of the following combinations best illustrates these types of resources?
1) rent, bonds, and money
2) oil, taxi drivers, and workers
3) soil, farmers, and tractors
4) salesmen, investors, and manufacturers

7. If consumers are to choose "wisely" in a Market economy, they must:
1) know where and when products are produced
2) know that the product was produced in a competitive market
3) know the prices of alternative products available
4) have enough money to buy anything they want

8. Twice as many tomatoes were grown this year as last. In a market economy:
1) the supply of tomatoes would stay the same this year
2) the demand for tomatoes would go down this year
3) the price of tomatoes would probably go down this year
4) the price of tomatoes would probably go up this year

9. The price of hats will probably be increased by:
1) new machines that reduce the cost of hat production
2) more capital investment by producers
3) a decrease in the demand for hats
4) a decrease in the supply of hats

10. The mechanism of command (authority) is used:
1) to some extent by democratic, as well as authoritarian, government
2) only by totalitarian governments
3) only by democratic governments
4) only by authoritarian governments

CORRECT ANSWERS: (1) 3; (2) 3; (3) 3; (4) 3; (5) 2; (6) 3; (7) 3; (8) 3; (9) 4; (10) 1
1. In economics, the term "demand" means:
   1) the quantity of goods and services purchased at a given moment in time.
   2) the amount of goods purchased over time.
   3) the amounts of goods that would be purchased at different prices.
   4) the quantities of goods and services that buyers would purchase if they had sufficient income.

2. In economics, the term "supply" means:
   1) the amount of product that a seller would provide at a given price.
   2) the amounts of goods that a seller would produce at different prices.
   3) the cost of production.
   4) the willingness of sellers to provide goods at high prices.

3. At a given moment in time, quantity supplied and quantity demanded are equal at a certain price. This price:
   1) will not change unless the supply and demand conditions change.
   2) must be rather low because buyers always prefer lower prices.
   3) is an equilibrium price.
   4) Two of the above are correct.

4. If the marginal utility of a hypothetical good declines continuously from the first unit:
   1) the demand curve will slope downward and to the right.
   2) the total utility will decline after the first unit.
   3) buyers will be willing to pay more for the last unit of the good than for the first.
   4) there is insufficient information to judge the nature of demand.
5. What will be the result if the marginal costs of a hypothetical good increase continuously from the first unit?
   1) The supply curve will slope downward and to the right.
   2) Total costs will be constant.
   3) Rational sellers will be willing to sell additional goods only at higher prices.
   4) There is insufficient information to judge the nature of supply.

6. At a given price, there are no shortages or surpluses. Therefore:
   1) at the price, the quantity supplied equals the quantity demanded.
   2) at this price, the market is in equilibrium.
   3) this price is a "market clearing price."
   4) All of the above are correct.

7. Out of the four possibilities listed below, a good is likely to be relatively cheap if:
   1) the marginal utility of additional units is low, and the marginal costs of additional output do not rise.
   2) the marginal utility of additional units is low, and the marginal costs of additional output rise quickly.
   3) the marginal utility of additional units is high, and the marginal costs of additional output rise quickly.
   4) the marginal utility of additional units is high, and the marginal costs of additional output do not rise.

8. Which of the following is the principal reason that the quantity demanded of a good tends to fall as its price rises?
   1) At higher prices, suppliers are willing to supply less.
   2) The increase in price shifts the demand curve downward.
   3) People feel less affluent and cut down on their use of the good.
   4) Demand has to fall to restore equilibrium after a price rise.

9. Which of the following is the principal reason that the quantity demanded of a good tends to rise as its price falls?
1) At lower prices suppliers are willing to supply more.
2) The decline in price shifts the demand curve upward.
3) The decline in price makes the good cheaper relative to other goods for which prices have not changed.
4) Demand has to rise to restore equilibrium after a price increases.

10. Which of the following conditions explains the upward slope of supply curves?
1) The law of diminishing returns applies.
2) For most firms, marginal cost tends to increase as output expands.
3) For most firms, marginal cost tends to decrease as output expands.
4) Responses 1 and 2 are both correct.

CORRECT ANSWERS: (1) 3; (2) 2; (3) 4; (4) 1; (5) 3; (6) 4; (7) 1; (8) 3; (9) 3; (10) 4

FILMSTRIPS

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stale 1: 2: 3: 4: 5: 6: 7 fresh
pleasure 1: 2: 3: 4: 5: 6: 7 pain
1. If a shortage occurs at a given price in a market with supply and demand conditions:
   1) supply exceeds demand
   2) demand exceeds supply
   3) the quantity demanded exceeds the quantity supplied
   4) the quantity supplied exceeds the quantity demanded

2. If a surplus occurs at a given price in a market with given supply and demand conditions:
   1) supply exceeds demand
   2) demand exceeds supply
   3) the quantity demanded is less than the quantity supplied.
   4) the quantity supplied is less than the quantity demanded.

3. Which of the following would NOT cause an increase in the demand for X?
   1) A decline in the price of X
   2) A decline in the price of Z, which is a complementary good
   3) An increase in the price of Z, which is a substitute good
   4) An increase in the buyers' preferences for X

4. Which of the following would cause a decrease in the quantity supplied of X?
   1) A decline in the price of X
   2) A decline in the costs of production
   3) An increase in the supply of X
   4) None of the above

5. After vigorous complaints by buyers, the government has fixed the sale price of X below the price formerly set by the market. As a result:
   1) the quantity supplied will exceed the quantity demanded
   2) the supply curve will shift to the left, and the fixed price will become an equilibrium price.
   3) the demand curve will shift to the right and the fixed price will become a "market-clearing price."
   4) the quantity demanded will exceed the quantity supplied.
6. From a given intersection of supply and demand, the demand curve declines. As a result:
1) price will fall, and the quantity demanded at the new equilibrium price will rise.
2) price will fall, and the quantity supplied at the new equilibrium price will rise.
3) price will fall, and the quantity demanded at the new equilibrium price will decline.
4) price will rise, and the quantity demanded will decline.

7. From a given intersection of supply and demand, the supply curve increases. As a result:
1) price will fall, and the quantity demanded at the new equilibrium price will rise.
2) price will fall, and the quantity supplied at the new equilibrium price will rise.
3) price will rise, and the quantity demanded will decline.
4) Two of the above.

8. The relative change in quantity resulting from a relative change in price is a measure of:
1) slope.
2) diminishing returns.
3) elasticity.
4) marginal utility.

9. A straight line demand curve that slopes downward and to the right:
1) is elastic with a negative slope.
2) is more elastic than other demand curves.
3) is inelastic.
4) has various elasticities at different prices.

10. If the demand curve is inelastic:
1) a decline in price will increase total revenue and an increase in price will increase total revenue.
2) a decline in price will decrease total revenue and an increase in price will increase total revenue.
3) an increase in price will increase total revenue and a decrease in price will increase total revenue.
4) an increase in price will decrease total revenue and a decrease in price will increase total revenue.

CORRECT ANSWERS: (1) 3; (2) 3; (3) 1; (4) 1; (5) 4; (6) 3; (7) 4; (8) 3; (9) 4; (10) 2
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The above graph shows the cost functions of a typical firm. Based on the graphic information, answer Questions 1 through 6.

1. At an output level of 60 units, the average total cost (ATC) is:
   1) $2.00
   2) $2.50
   3) $3.50
   4) None of the above

2. At an output level of 120 units, the average variable cost is approximately:
   1) $3.20
   2) $3.00
   3) $3.75
   4) $5.00
3. At an output level of 120, the marginal cost is approximately:
   1) $3.00
   2) $3.33
   3) $3.25
   4) None of the above are correct.

4. Which statement is true about marginal cost for footballs?
   1) It intersects the average total cost curve at its lowest point.
   2) The marginal cost is lowest when the firm is experiencing production from 30 to 60 footballs.
   3) The marginal cost is highest when the firm is experiencing production from 120-150 footballs.
   4) All of the above are correct.

5. With the cost data shown, the average fixed costs of the firm will:
   1) decline as output expands.
   2) remain constant as output expands.
   3) rise as output expands.
   4) Two of the above are correct.

6. With the cost data shown, the average variable costs of the firm will:
   1) decline to a low point as output expands and then rise.
   2) remain constant over all levels of output.
   3) rise over all levels of output.
   4) Two of the above are correct.

7. Fixed costs _______ equal total costs.
   1) minus marginal costs
   2) plus average variable costs
   3) minus average variable costs
   4) plus variable costs

8. Marginal costs are:
   1) the extra fixed costs per additional unit of output.
   2) the change in total costs as output changes.
   3) the change in variable costs.
   4) the sum of variable and fixed costs per unit output.

9. If the variable costs of producing 10 units of X are 60 and average total costs are 10, the:
   1) fixed costs are 30.
   2) average variable costs are 5.
   3) average fixed costs are 4.
   4) total costs are 75.
10. On a graph, the marginal cost (MC) curve cuts the average total cost (ATC) curve:
1) at the lowest point on ATC.
2) at the same output where variable costs equal fixed costs.
3) at the output where MC is at the lowest level.
4) at the output where average variable costs equal average fixed costs.

CORRECT ANSWERS: (1) 3; (2) 1; (3) 4; (4) 4; (5) 1;
(6) 1; (7) 4; (8) 2; (9) 3; (10) 1
1. Economic theory assumes that the principal motivating force of business enterprise is to:
   1) reduce costs to the lowest level possible
   2) increase revenues to the highest level possible
   3) maximize profits
   4) produce the greatest good for the greatest number of people

2. The Market harnesses the energies of individual self-interest to achieve broader social goals, so it is said. The major factor that contributes to this process is:
   1) individual altruism
   2) the activity of socially responsible business leaders
   3) competitive markets
   4) economic planning and coordination by the central government

3. In the long-run equilibrium position of the competitive firm, the amount of "pure" profit:
   1) must be large
   2) must be negative (losses)
   3) may be positive or negative (losses)
   4) must be zero

4. If a competitive firm is operating at less than the maximum short-run profit, it should:
   1) shut down
   2) increase price
   3) decrease price
   4) alter output

5. In the long run, which of the following costs must the seller be able to cover in order to remain in business?
   1) Average variable costs
   2) Average fixed costs
   3) Average total costs
   4) Variable costs

6. In the short run, the rational seller will not continue in operation if:
1) the sale price covers only average variable costs
2) the sale price covers only average fixed costs
3) the sale price covers average total costs
4) losses do not exceed fixed costs

7. The long run equilibrium position of the competitive firm(s) is considered to be a norm of economic organization because:
   1) there are a large number of buyers and sellers participating in the market.
   2) marginal costs are the lowest level.
   3) the product price equals marginal costs at the lowest average total costs.
   4) it is the outcome of government regulation.

8. Which of the following conditions is characteristic of a competitive market?
   1) Product prices are fixed by the government.
   2) Products are not homogeneous.
   3) Sellers have exclusive franchises for given geographic areas.
   4) All participants have sufficient information about supply and demand conditions.

9. A firm with an infinitely elastic demand curve is:
   1) a "price-taker."
   2) a "price-maker."
   3) a seller in a competitive industry.
   4) Two of the above are correct.

10. If a competitive firm is operating at an output where marginal costs equal marginal revenue:
    1) it is maximizing profits.
    2) total revenue is maximized.
    3) price must equal the minimum average total costs.
    4) marginal costs must be zero.

CORRECT ANSWERS: (1) 3; (2) 3; (3) 4; (4) 4; (5) 3; (6) 2; (7) 3; (8) 4; (9) 4; (10) 1
MODULE VII

(Posttest for Weatherford College and NTSU)

1. If demand, price, and marginal revenue schedules are identical, the firm is:
   1) monopolistic
   2) competitive
   3) avaricious
   4) None of the above are correct

2. A decline in the demand caused by the entry of another firm into a monopoly market would require the monopoly to:
   1) decrease output and increase price
   2) decrease output and decrease price
   3) increase output and increase price
   4) increase output and decrease price

3. Pure monopolies face a demand curve that:
   1) is more elastic than a competitor
   2) is less elastic than a competitor
   3) has the same elasticity as a competitor
   4) is more or less elastic than a competitor, depending upon the shape of its cost curves

4. A monopoly's short-run supply curve is the same as:
   1) its marginal cost curve above average total cost
   2) its marginal cost curve
   3) its marginal cost curve above average fixed cost
   4) its marginal cost curve above average variable cost

5. Which of the following characteristics would identify a firm as a monopolist?
   1) One seller is a "pricemaker."
   2) It produces an output where MC=MR.
   3) It charges a price equal to marginal revenue.
   4) It earns "pure" profit.

6. If the demand and marginal revenue schedules are the same, the seller is:
   1) a monopolist
   2) a "price taker"
   3) an oligopolist
   4) in equilibrium
7. If the monopolist's marginal revenue equals marginal costs, the single seller:
1) must have total costs equal to total revenue
2) is in equilibrium
3) must increase the price to maximize "pure" profit
4) must increase the price to maximize total revenue

8. Production under monopoly would be as efficient as under competition if, at equilibrium:
1) the product price equaled the minimum ATC and also the MC
2) the maximum output were produced
3) the product price were less than marginal revenue
4) the seller sought to minimize "pure" monopoly, price

9. It is always in the self-interest of the monopolist to:
1) charge the highest possible price that any buyer will pay
2) charge the price that maximizes total revenue
3) expand output until marginal costs equal marginal revenue
4) reduce output and raise the price

10. Compared to the level of demand, a monopoly seller of electricity with a very large supply capacity is earning a large amount of "pure" profit. A public regulatory body could improve the operation of the market by:
1) instructing the monopolist to operate at the equilibrium output.
2) compelling the monopolist to reduce total costs.
3) setting the sale price equal to minimum average total costs.
4) allowing the single seller to raise the price.

CORRECT ANSWERS: (1) 2; (2) 2; (3) 2; (4) 4; (5) 1; (6) 2; (7) 2; (8) 1; (9) 3; (10) 3.

ECONOMICS

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1. A firm's production of golf hats increased by almost twenty percent after it made special efforts to hire workers who possessed high finger dexterity and eye/hand coordination. The increased production occurred because these special work skills enabled workers to sew faster. In this illustration, which of the following statements applies?
   1) The supply curve for workers with special work skills is to the right of the supply curve for those without these work skills.
   2) The supply curve for workers with certain work skills is to the left of the supply curve for those without these special skills.
   3) The demand curve for workers with certain special work skills is to the left of the demand curve for workers without those skills.
   4) The demand curve for workers with special work skills is to the right of the demand curve for those who don't have specialized skills.

2. Bunny Girls often recieve higher wages than those who teach reading. What is the economic theory that justifies this wage difference?
   1) Bunny Girls are scarce.
   2) Bunny Girls are more skilled than those persons who receive smaller wages.
   3) Compared to reading teachers, Bunny Girls are scarce relative to the demand for their services.
   4) Services provided by Bunny Girls are socially more important than are the services that reading teachers provide.

3. In a Market economy, the role of profit:
   1) rewards businessmen for being socially responsible.
   2) causes businesses to produce what consumers demand.
   3) causes businesses to be more efficient.
   4) Two of the above answers are correct.
4. A firm will invest in additional units of capital equipment only if:
   1) the additional units of capital are highly efficient.
   2) the additional units of capital represent the best of modern innovative technology.
   3) the marginal efficiency of capital exceeds the interest rate.
   4) the additional units of capital make efficient use of the scarce resources of land and labor.

5. The negative slope of the firm's marginal revenue product curve for labor is the firm's:
   1) demand curve for labor.
   2) supply curve for labor.
   3) marginal cost of labor.
   4) Two of the above are correct.

6. The competitive wage is the firm's:
   1) demand curve for labor.
   2) supply curve for labor.
   3) marginal revenue product curve for labor.
   4) None of the above answers is correct.

7. In a Market economy, interest is the principal device by which:
   1) people are induced to save.
   2) people are induced to give up liquidity.
   3) firms measure the productivity of capital.
   4) Two of the above answers are correct.

8. To a large extent, the wage income people receive depends upon:
   1) the degree to which they can efficiently produce something the community demands.
   2) the degree to which they are highly creative.
   3) the degree to which they are motivated to help others.
   4) Two of the above answers are correct.

9. In a competitive market, rent (the income of the factor of production, land) is:
   1) determined by forces others than supply and demand.
   2) like other incomes, largely determined by the forces of supply and demands.
   3) exempt from marginal revenue produce analysis because of the inelasticity of the supply curve for land.
   4) Two of the above are correct.
10. In a market economy, the distribution of money income is inextricably linked to:
1) the distribution of society's goods and services.
2) the problem of motivation.
3) providing people with purchasing power.
4) All of the above answers are correct.

CORRECT ANSWERS: (1) 4; (2) 3; (3) 4; (4) 3; (5) 1;
(6) 2; (7) 4; (8) 1; (9) 2; (10) 4
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