### APPENDIX 1

**AGE AND ACADEMIC PERFORMANCE OF SUBJECTS**

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<thead>
<tr>
<th>S.No.</th>
<th>Age</th>
<th>Percent Marks in 1st Semester</th>
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APPENDIX 2
COURSE CONTENT FOR RESEARCH (PROCESS)

1. **Introduction to Research**:
   - Meaning and Definition of Research.
   - Development of the Scientific Method of Discovery.
   - Inductive and Deductive Reasoning.
   - Need, Importance and Scope of Research in Physical Education.

2. **Types of Research**:
   - Pure Research.
   - Applied Research.
   - Action Research.

3. **Formulation and Development of the Research Problem**:
   - Sources of Research Problems.
   - Methods for Locating Research Problems.
   - Criteria in Selecting a Research Problem.
   - Preparing the Research Proposal.

4. **Survey of Related Literature**:
   - Need for Survey of Related Literature.
   - Critical and Allied Literature.
   - Sources of Related Literature.
     - Books.
     - Journals.
     - Encyclopedias.
     - Dictionaries.
     - Microsources.
     - Magnetic Tape Records.
   - Method of Survey of Related Literature.
     - Working Bibliography.
     - Keywords.
     - Note Taking.
     - Cards.
     - Abstracting.
   - Summarizing Reviewed Literature.
APPENDIX 2 (continued)

5. **Philosophical Research**:
   - Meaning of Philosophical Research.
   - Need and Justification for Philosophical Research.
   - Method of Philosophical Research.

6. **Historical Research**:
   - Meaning and Purpose of Historical Research.
   - Functionality of Historical Research.
   - Sources of Historical Data.
     - Primary Sources.
     - Secondary Sources.
   - Evaluation of Historical Data.
     - External Criticism.
     - Internal Criticism.
     - General Principles of Evaluation.
   - Writing the Historical Research Report.

7. **Surveys and Case Studies**:
   - Meaning of Survey, and Case Study.
   - Method of Questionnaire Survey.
     - Construction of the Questionnaire.
     - Trial Run.
     - Final Writing.
     - Characteristics of a Good Questionnaire:
       - Administration and Follow-up.
       - Aids to Responses.
       - Sampling.
   - Method of Interview Survey.
     - Preparation of Interview Schedule.
     - Outlining the Area of Investigation.
     - Conducting the Interview.
     - Writing the Survey Report.
APPENDIX 2 (continued)

- The Case Study Method.
  - Identifying the "Cases".
  - Indepth Investigation.
  - Writing the Case Study Report.

8. Experimental Research:

- Development of Experimental Research.
- Method of Experimental Research.
  - Identifying Independent, Dependent, and Extraneous Variables.
  - Stating the Hypothesis.
  - Conducting the Experiment.
  - Testing and Errors.

- Experimental Designs.
- Writing the Experimental Research Report.
APPENDIX 3

COURSE OBJECTIVES

Note: The objectives are presented topicwise. Numerals in parentheses at the end of statements indicate the taxonomical location of the objectives.

I. Meaning of Research:
   a) To define and describe: Science, Scientific Method, Research (1.10).

II. Types of Research:
   a) To define or describe: Pure Research, Applied Research, Action Research (1.10).

III. Formulation and Development of Research Problem:
   a) To define or describe: Hypothesis, Theory, Law, Principle (1.10).

   b) To identify the parts of a Research Proposal: Statement of Problem, Delimitation, Limitations, Hypothesis, Definition and Explanation of Terms, Significance of the Study. (1.20).

   c) Knowledge of Current Trends in Research in Physical Education (1.20).

   d) Knowledge of Criteria in Selecting a Problem (1.20).

   e) Knowledge of the Methodology of Formulating and Developing a Research Problem (1.30).

   f) To translate a Research Title into one's own words (2.10).

   g) To Estimate or Predict Consequences of Alternative Courses of Action. (2.30).
APPENDIX 3 (continued)

h) To locate a Research Problem using Appropriate Methodology. (3.00).

i) To prepare the justification for undertaking a study. (5.10).

j) To propose methods for testing hypotheses in a given/chosen problem. (5.20).

k) To formulate a problem in the light of the findings of related literature. (5.30).

l) To propose and revise hypotheses (5.30).

m) To evaluate a given/chosen problem against the criteria of a good research problem (6.00).

Survey of Related Literature:

a) To define or describe the meaning of critical and allied literature. (1.10).

b) To describe the meanings of an abstract, an extract, a bibliography card and a note card. (1.10).

c) To notice trends on the basis of the findings of a number of studies. (1.20).

d) To identify trends in research in Physical Education. (1.20).

e) To know the various kinds of literature. (1.20).

f) To know the method of surveying literature. (1.20).

g) To prepare an abstract of a given research study.

h) To translate tables and graphs meaningfully. (2.10).

i) To comprehend and interpret various kinds of literature. (2.20).
APPENDIX 3 (continued)

j) To distinguish between warranted and unwarranted conclusions drawn from a body of data given in a study. (2.20).

k) To predict continuation of trends in research. (2.30).

l) To conduct a thorough search for literature in a given area. (3.00).

m) To recognize unstated assumptions in a given piece of literature. (4.10).

n) To distinguish facts from hypotheses when both are not explicitly labelled. (4.10).

o) To distinguish conclusions from statements which support the conclusions when both are not explicitly labelled. (4.10).

p) To identify interrelationships among the ideas, opinions, points of view, etc., in a given study. (4.20).

q) To identify logical errors in a given study. (4.30).

r) To judge the honesty and accuracy of a given research report on the basis of the exactness of statements, proof offered, etc. (6.10).

s) To compare meaningfully the findings of a number of studies. (6.20).

Philosophical Research:

a) To understand the vocabulary used in Philosophy. (1.10).

b) To know conventional ways of presenting ideas in philosophical research. (1.20).

c) To identify the trends in philosophical research in physical education. (2.20).
APPENDIX 3 (continued)

d) To know the areas encompassed by philosophical research in Physical Education. (1.20).

e) Knowledge of the criteria (logic, critical thinking) for evaluating ideas, beliefs, concepts, etc. (1.20).

f) Knowledge of the methodology of philosophical research. (1.20).

g) Knowledge of philosophical bases for particular decisions. (1.30).

h) To translate a given philosophical abstraction by giving an example or illustration. (2.10).

i) To understand the central idea in a given philosophical research. (2.20).

j) To distinguish value judgements from logical statements. (2.30).

k) Ability to apply the steps in philosophical research to solve specific problems. (3.00).

l) Ability to apply generalizations obtained from philosophical research to specific situations. (3.00).

m) Ability to identify unstated assumptions in a given report of a philosophical research. (4.10).

n) Ability to recognize the arguments necessary to validate a conclusion in a philosophical research setting. (4.20).

o) Ability to check the consistency of hypotheses with available facts. (4.20).

p) Ability to analyze relationships between elements in a given report of a philosophical research. (4.20).

q) Ability to infer an author's purpose, point of view, professional stand, or feelings as exhibited in his philosophical dealings (writing) on a particular topic. (4.30).
APPENDIX 3 (continued)

r) Ability to write a report of philosophical research on the basis of given facts, logical position, etc. (5.10).

s) Ability to synthesize many philosophical approaches to suggest possible ways of solving a given problem. (5.20).

t) Ability to formulate philosophical hypotheses on the basis of given facts and to revise these hypotheses in the light of one's own logical reasoning or critical thinking. (5.30).

u) To evaluate a given philosophical research report in terms of internal consistency, logical arguments, precision of statements, etc. (6.10).

v) Ability to identify logical errors in proposed solutions to specific problems (6.10).

w) Ability to recognize alternative values involved in given courses of action in solving a problem. (6.20).

**Historical Research:**

a) To define or describe the meaning of historical research. (1.10)

b) To recognize or recall sources of historical data. (1.10).

c) To describe the scope of historical research in physical education. (1.10).

d) To recall or recognize the criteria for evaluating historical data (1.20).

e) To describe the general method of historical research. (1.20).

f) To describe the principles of evaluation of historical data. (1.30).
APPENDIX 3 (continued)

g) To translate a historical account into simpler language. (2.10).

h) To interpret historical data with appropriate qualifications. (2.20)

i) To extrapolate and predict continuation of trends. (2.30)

j) To be aware of factors which may make predictions in accurate. (2.30).

k) To apply external and internal criticism to a given historical report. (3.00).

l) To analyse a given historical report and identify unstated assumptions, statements of facts, hypotheses, etc. (4.10).

m) To recognize the causal relations and the important and unimportant details in a given historical report. (4.20).

n) To infer an author's purpose, professional stand, traits of thought, and his general conception of the area which he has addressed in a given historical report. (4.30).

o) To recognize the bias, if present, in a given historical report. (4.30).

p) To write a historical research report keeping in mind the general principles involved. (5.10)

q) To propose ways of testing historical hypotheses. (5.30)

r) To formulate and modify historical hypotheses. (5.30).

s) To assess the reliability or trustworthiness of a historical account on the basis of external criticism. (6.10).

t) To evaluate a historical account on the basis of internal criticism. (6.20).
APPENDIX 3 (continued)

VII. **Surveys and Case Studies**

a) To describe the meaning of survey research and case study research. (1.10).

b) To describe the scope of survey research and case study research in physical education. (1.20).

c) To state the criteria of a good questionnaire. (1.20).

d) To describe the general methodologies for survey and case study research. (1.20).

e) To describe the general methodologies for preparing a questionnaire. (1.20).

f) To translate general principles of conducting survey and case study researches by giving specific examples (2.10).

g) To distinguish among warranted, unwarranted or contradicting conclusions drawn from a body of data obtained by questionnaire, interview, or case study method. (2.20).

h) To construct a questionnaire for a given survey. (3.00).

i) To prepare an interview schedule along with major questions. (3.00).

j) To recognize unstated assumptions in communications dealing with survey and case study researches. (4.10).

k) To distinguish facts from hypotheses in communications dealing with survey and case study researches. (4.10).

l) To analyze the relations of statements in an interview survey, to distinguish relevant from irrelevant statements. (4.20).
APPENDIX 3 (continued)

m) To infer a person’s attitude towards issues in physical education from traits of thought and feeling as exhibited in his work or his life. (4.30).

n) To write comprehensive reports of questionnaire, interview and case study researches. (5).

o) To propose ways of testing hypotheses through questionnaire and interview surveys and case studies. (5.20).

p) To notice logical errors in interview responses. (6.10).

q) To evaluate a questionnaire according to the criteria of a good questionnaire (6.20).

r) To evaluate the suitability of given samples for specific studies. (6.20).

VIII. Experimental Research:

a) To define and describe Experimental Research and Dependent, Independent and Extraneous Variables. (1.10)

b) To have knowledge of the trends in experimental research in physical education. (1.20).

c) To know the method of experimental research in general. (1.20).

d) To know various experimental designs and statistical applications appropriate to them. (1.20).

e) To distinguish among warranted, unwarranted, or contradicting conclusions drawn from a body of data. (2.20).

f) To draw conclusions from a body of data and state them effectively. (2.30).
APPENDIX 3 (continued)

g) To use experimental research in solving a given problem. (3.00).

h) To distinguish facts from hypotheses in a given experimental research situation. (4.10).

i) To check the consistency of hypotheses with given data. (4.20).

j) To distinguish cause-and-effect relationships from other sequential relationships. (4.20).

k) To propose experimental procedures for testing given hypotheses. (5.20).

l) To integrate the results of an investigation into an effective plan to solve a problem. (5.20).

m) To formulate appropriate hypotheses and modify these in the light of new data. (5.30).

n) To evaluate a given report of experimental research. (6.10).

o) To evaluate the suitability of given experimental designs for particular studies. (6.20).
APPENDIX 4

TEST QUESTIONS

Note: Numbers in parentheses indicate taxonomical location of questions.

MEANING OF RESEARCH:

1. Out of the words given below, some characterize research. Tick mark those words.
   a) Hap hazard   f) Logical
   b) Guesswork   g) Vague
   c) Empirical   h) Systematic
   d) Planned   i) Precise
   e) Objective   j) Aimless

2. The Inductive, Deductive, and Scientific Approaches for the discovery of new facts are best described by one of the following sentences. State the approach in front of the sentence.
   a) Specific observations to hypothesis to data collection to conclusions.
   b) General assumption to specific application.
   c) Specific observations to generalizations.

TYPES OF RESEARCH:

3. Identify the statements given below as description of basic, applied or action research.
   a) Investigation for solving a practical problem with possibility of generalization.
   b) Original investigation for the advancement of scientific knowledge.
   c) Investigation for solving a localized problem.
APPENDIX 4 (continued)

4. Given below are a number of statements which characterize either basic, applied, or action research. In the space provided after the each statement, write either Basic, Applied, or Action to indicate the type of research characterized.

STATEMENTS:

a) Formulation of new generalizations, explanatory principles, and scientific theories or laws that go beyond the populations and situations represented.

b) Judgement of the quality of the investigation based on the possibility of generalizing the methods and findings beyond the sample and situation studied.

c) Interest in the particular subjects studied rather than in the total theoretical population represented by the sample under study.

d) High value placed on sampling procedures as a basis for generalization.

e) Determination of the value of the research in terms of practical problems solved.

f) Usually stemming from an urgent practical need, with a goal of application of results and improvement of practice in a particular setting, through processes of group planning, execution and evaluation.
APPENDIX 4 (continued)

g) Desirability of technical training or equipment which frequently involves statistical, sampling, testing or experimental procedure.

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FORMULATION AND DEVELOPMENT OF RESEARCH PROBLEM:

5. The statements given below refer to criteria (1.20) of a research problem. Judge whether they are true or false and tick mark either T or F to indicate your answer.

IMPORTANT:

Please do not guess, negative marks will be given in this question for wrong answers.

a) Significance or contribution of a research problem should be evaluated in terms of the applicability of its findings.

T/F

b) If any consideration is given to the time and cost involved in a research, it will reduce the quality of the investigation.

T/F

c) The contributions of basic and applied research should be evaluated by the same criteria.

T/F

d) It is not possible at all to comment about the possible usefulness of a particular research before its completion.

T/F

e) To be accepted as "Good", a problem must be unique.

T/F
APPENDIX 4 (continued)

f) Replication of all research is essential.

T/F

g) Interest of the scholar is absolutely necessary for successful completion of a research.

T/F

h) As technical assistants are available in all laboratories, no knowledge of testing procedure is necessary for the investigator.

T/F

i) Valid and reliable instruments for measurement are not necessary if a good research design is used.

T/F

j) The criterion variable must be operationally define before undertaking any research.

T/F

k) Ethics have no place in research.

T/F

6. Define a Hypothesis.

(1.10)

7. List the steps in locating the research problem, given by Clarke and Clarke.

(1.20)

8. Which of the following methods will result in a good hypothesis. Indicate your answer by placing a tick mark on the right side of the statement.

(1.20)

a) Making calculated guesses.

b) Making wild guesses.

c) Using available facts to predict relationships between variables.
APPENDIX 4 (continued)

d) Imagining relationship between variables.

9. List down the chapter headings and subheadings (1.10) for a Research Proposal.

10. Describe what the following terms mean with (1.10) reference to the Research Proposal.

a) Background
b) Delimitation
c) Limitations
d) Significance of the study.

11. While preparing a research proposal, the (2.10) scholar performs many tasks some of which are mentioned below. From the list given at the end, select the appropriate word for each task description.

a) Acknowledges the weaknesses in the research design and methodology.
   (  )

b) Writes down the purpose of the Study.
   (  )

c) Synthesizes available facts and develops a logical base for the proposed research.
   (  )

d) Specifies the limits of the study.
   (  )

e) Points out the specific contribution that the study is likely to make.
   (  )

f) Proposes a specific outcome or a relationn. observation.
   (  )

g) Describes the meaning of important words or phrases.
   (  )
APPENDIX 4 (continued)

Delimitation, Statement of the Problem, Limitations, Background, Definition and Explanation of Terms, Significance of the Study, Hypothesis.

12. Before being allowed to undertake a research (2.20) study, the scholar has to submit a research proposal which should include the background or rationale of the research, statement of the problem, delimitation, limitations, definition of terms, and significance of the study.

INSTRUCTIONS:

Describe in your own words what is meant by each of the above terms.

SURVEY OF RELATED LITERATURE:

13. This is a multiple choice-question. Complete (1.10) each sentence given below by using one of the options provided. Indicate your answer by placing a tick mark on the left hand side of the option you choose.

a) A Keyword is:
   0 a word that explains the meaning of something.
   0 a word that serves as a Key in solving problems.
   0 a word used in locating relevant literature.
   0 an important word that must be operationally defined.

b) A Bibliography is:
   0 a biographical account of a person's life.
   0 a type of graph used in the Bible.
   0 a list of literature sources.
   0 none of the above.
APPENDIX 4 (continued)

c) Author Index is:
   o a list of authors.
   o a measure of how good an author is.
   o a list of books written by an author.
   o none of the above.

14. List down the purposes served by a review of related literature.

15. Name any four journals in the field of Physical Education.

   NOTE: Sportswear, etc. are not journals.

16. Name any two indexes.

17. The appropriate method for making a working bibliography is:
   a) To consult the literature sources one by one in any order.
   b) To start with earliest (oldest) source and proceed onward.
   c) To start with the latest sources and proceed backward.

18. The primary need in library reading is to determine whether or not the material is actually pertinent. The places in a book where information to determine this may be obtained are:
APPENDIX 4 (continued)

19. DIRECTIONS:
(2.20) The report of an investigation conducted by Subhas Basumatary is given below. Read the report carefully and prepare an abstract.

REPORT:
The study was undertaken to assess the relationship between soccer playing ability and physical fitness. Tests of Physical Fitness were 45-meter dash, standing broad jump, shuttle run, and 12-minutes Run/Walk.

Soccer playing ability during actual game and measured by judges' ratings. Three judges rated the ability and the average of the three was calculated.

Subjects for the study were soccer players of inter-college level studying at LNCPET, Gwalior. Statistical treatment of data comprised of Product Moment Correlation Coefficients computed between soccer playing ability and physical fitness item scores.

The following conclusions were drawn:

1. Speed is positively related with soccer playing ability.

2. Power is positively related with soccer playing ability.

3. Agility is positively related with soccer playing ability.

4. Cardio-vascular endurance is positively related with soccer playing ability.
APPENDIX 4 (continued)

PHILOSOPHICAL RESEARCH:

20. What are the two conditions that justify (1.10) the use of philosophical research.

21. List down the steps in scientific problem (1.20) solving as suggested by Dewey.

22. List down the steps of philosophical research (1.20) given by Clarke and Clarke.

23. Given below are three facts related with physical education. Also given are three alternative courses of action that may be followed in conducting physical education classes. Predict the consequences of each course of action with reference to : i) Learning of skills, and (ii) Development of attitude towards physical education.

FACTS:

a) Physical Education is an integral part of the overall education.

b) Compulsory participation may result in the development of negative attitude.

c) Homogenous grouping is better for skill learning.

COURSE ALTERNATIVES:

a) Compulsory participation of all students in Physical Education activities according to age group.

b) Compulsory participation of all subjects in homogenous groups formed on the basis of General Motor Ability Scores.

c) Voluntary participation of subjects according to age groups.

d) Voluntary participation of subjects in homogenous groups formed on the basis of General Motor Ability Scores.
APPENDIX 4 (continued)

24. As a scholar undertaking a philosophical research project for developing principles of physical education for elementary school children, you have the following facts available to you:

FACTS:

a) Whenever a child acts, he or she is trying to satisfy a need - physical, psychological, or social.

b) A child always wants to escape from pain producing situations.

c) Hunger, exercise, and rest are important needs for a child.

d) Every child wants to be loved by his or her parents and teachers.

e) Every child wants to belong to some group.

f) Every child wants to have a sense of achievement in all his or her activities.

g) Every child wants approval from his or her parents and teachers.

h) Every child wants to be secure.

i) Every child wants to cooperate with others.

j) Every child likes to share with others his or her toys, books, etc.

k) Love is an important need for all children.

DIRECTIONS:

Using the steps given by Clarke and Clarke (refer to your answer for Question 22), develop any two principles for elementary school physical education programmes.
APPENDIX 4 (continued)

25. Read the passage given below carefully. (4.10)

The most vital and far reaching decisions made in education are philosophically based. The objectives of education, the organization of curriculum, the content of courses and the selection of teaching methodology are established more often by philosophical considerations rather than through scientific means. Even before objectives are set, the ideology of a society is determined on a philosophical basis.

In this time of science, man is prone to rely upon material resources; and, certainly, these have developed in overwhelming abundance. To meld these resources for the common good is more vital today than increasing them. Philosophical studies are needed in education, which, of course, includes physical education, and they should be dedicated to the task of establishing the vision of ultimate ends.

DIRECTIONS:

Which of the following statements most nearly expresses the logical conclusion of the argument in favour of philosophical research. Indicate your answer by placing a tick mark on the left hand side of the statement.

STATEMENTS:

a) Philosophical research is better than other types of research.

b) Philosophical research has been used widely in solving educational problems.

c) Philosophical research is better than other types of research in solving certain types of problems because philosophy is the basis of issues which form the background of these problems.
APPENDIX 4 (continued)

d) Philosophical research is better because science has been misused whereas philosophy cannot be misused.

HISTORICAL RESEARCH:

26. Define historical research.
(1.10)

27. List the needs for historical research.
(1.10)

28. List down the various primary sources in historical research.
(1.10)

29. List the steps followed in historical research.
(1.20)

30. Write a brief note on the scope of historical research in physical education.
(1.10)

31. a) An investigator is engaged in external criticism of historical sources collected by him. In ordinary English, What is he doing?

v) When the same investigator performs internal criticism, what will he be doing (explain in ordinary English).

32. An investigator studying the growth of physical education in India since 1980 used the number of students undertaking research at Master's Level (MPE) as one of the criterion. He found a constant increase in that number. Which one of the graphs given below best represents this finding. Indicate your answer by placing a tick mark over the alphabet designating the graph (A, B, C, or D).
33. While searching for information pertaining (2.20) to the popularity of various sports during the 19th century, a historian found a graph which is given below. Making your judgements only in terms of the information given in the graph, place a tick mark against alphabet:

a) If the item is definitely true.
b) If the item is probably true.
c) If the information given in the graph is not sufficient to decide whether the item is true or false to any degree.

d) If the item is probably false.

e) If the item is definitely false.

ITEMS:

1. Football was more popular in 1890 than in 1880. A B C D E

2. Hockey was more popular in 1880 than in 1890. A B C D E

3. Football was more popular than Hockey in 1880. A B C D E

4. Football was less popular than Hockey in 1890. A B C D E

5. The popularity of football was same in 1880 and 1890. A B C D E

6. The popularity of football increased from 1880 to 1890 because boys who were not playing any game in 1880 started playing football in 1890. A B C D E

7. The popularity of Hockey decreased from 1880 to 1890 because many Hockey players started playing football. A B C D E
APPENDIX 4 (continued)

34. Read the paragraphs given below carefully.

(2.20)

External criticism is concerned with establishing the date, place, and authorship of the document. Problems of external criticism, in testing the genuineness of a document or remain, involved questions about the characteristics of an author and his qualifications; and factors or conditions that may have influenced the production of the document such as time, place, purpose etc.

Internal criticism, on the other hand, deals with the problem of evaluating the accuracy and trustworthiness of the sources. Although they may be genuine, whether or not the sources reveal a true picture is questioned.

The competence, honesty, bias, and actual acquaintance of the author with the facts are also evaluated. Questions such as the following are raised. Did the author have any motive for distorting the facts? Was he subject to pressure or fear? How long after the event did he make a record of his testimony, and was he able to remember accurately what happened? Does his version agree with the version of other competent witnesses?

DIRECTIONS:

On the basis of information given in the above paragraphs, judge whether each of the statements given below is true or false. Indicate your answer by placing a tick mark over either T or F.

a) To know the author of a document is not necessary. T/F

b) To know the qualifications of an author is not important, because in ancient times there used to be no degrees. T/F

c) A good (trustworthy) author is always good whether he is writing within his area of expertise or outside that area. T/F
APPENDIX 4 (continued)

d) If the name of the author of a document is known, the document can be considered trustworthy. T/F

e) Evaluation of the contents of a document should be carried out in view of the times and conditions under which it was produced. T/F

f) Two sources are found to report the same event but one source was produced the same day as the event took place while the other was produced two weeks later. The earlier source is more reliable. T/F

35. Given below are a number of historical sources. (1.10) Indicate whether they are primary or secondary by placing either P (for Primary) or S (for Secondary) in the space provided against each source.

1. Attendance record at LCPE for the year 1960.

2. A Summary of the anecdotal records of students. The anecdotal records were kept by Dr. P.M. Joseph and the summary was prepared by his P.A.

3. A photograph of students who did BPE from LCPE in 1960.

4. The original lesson plans prepared by the first batch of LCPE students.

5. A photo-copy of the same lesson plans.

6. The building of the Basketball Stadium (at NCPE) where theory classrooms and offices were located in 1958.

7. A photograph of students' accommodation at LCPE in 1957.
APPENDIX 4 (continued)

8. The tape recorded first speech given by Dr. P.M. Joseph to the LCPE students in 1957.

36. The following is a copy of the title page (3.00) of a book.

GRAY'S ANATOMY
Descriptive and Applied
34th Edition
Edited by
D.V. Davies
New Delhi
Orient Longmans
1967

DIRECTIONS:
You are investigating the life and works of Henry Gray (1824-1890), especially his contribution to the study of anatomy. Would you credit the work in the book, whose title page is given above, to Henry Gray.

YES /NO

Give reasons in support of your answer.

37. Given below is a title page from a book:
(3.00)

Pattern of Physical Education in America:
a critical study
by
C.P. Pathak, M.A., LL.B.
(Member of Parliament)
Based on the author's first hand study during his recent visit to USA (May 4-10, 1967)
APPENDIX 4 (continued)

As an investigator studying the pattern of physical education in America and Canada from 1940 to 1980, will you consider the contents of this book trustworthy?

Give reasons in support of your answer.  YES/NO

38. You are doing research on the attitude of Indian women toward physical activities during the first half of the 20th century (1900 to 1950). During the study you locate the following article published in THE TIMES OF INDIA, 20th January, 1926.

NO THANKS, I'll Just Sit This Out.

-by Meera Ganguli.

I am about as physically unfit as I can manage and I intend, happily, to stay that way. From the viewpoint of the female, I can see many advantages in simply sitting, with your legs crossed gracefully, while some other girl gets her face all red chasing a tennis ball. First of all, the athletic girl is likely to develop strange bulges and bumps called muscles. And if you develop muscles you are liable to be tempted to use them. If I were capable of opening windows on trains, I might just go ahead and do it, thereby depriving some men of a feeling of superiority and, Heaven knows, they are complaining enough about that already.

My exercise is provided by a sievelike mind that keeps me running up and down stairs after things I forgot on the first trip. This is enough to use up my daily caloric intake and keep me slim.

DIRECTIONS:

Answer the following questions after carefully reading the above article.

a) Is the article authentic?  YES/NO

b) Will you consider the contents of the article as a true representative of the author's views on physical activity?  YES/NO
APPENDIX 4 (continued)

39. Read the following passage carefully.
(4.10)

In ancient India, people lived an existence that was very religious in nature. Hinduism stressed that the human soul passed through several incarnations (lives) before being united with Brahma, the supreme goal. The quickest and most certain way to attain this goal was to refrain from catering to the body and enjoying worldly things. The person who desired to be holy ignored the physical needs of the body and concentrated solely on spiritual needs. It can readily be seen that physical activity had little place in the culture of ancient India.

INSTRUCTIONS:

What is the unstated assumption in the above passage leading to the conclusion that "physical activity had little place in the culture of ancient India." Indicate your answer by placing a tick mark against the alternative chosen. Your judgement should be based only on the information given in the passage.

ASSUMPTIONS:

A- All the people in ancient India were holy.
B- All the people in ancient India were Hindus.
C- All the people in ancient India were religious.
D- All the people in ancient India were holy and religious.
E- All the people in ancient India wanted to be holy.
APPENDIX 4 (continued)

40. While reporting on Physical Education in ancient India, an author wrote as follows:

A- People in ancient India lived an existence that was very religious in nature.

B- Hinduism stressed that the human soul passed through several incarnations (lives) before being united with Brahma, the ultimate goal.

C- The quickest and most certain way to attain this goal was to refrain from catering to the body and enjoying worldly things.

D- The person who desired to be holy ignored the physical needs of the body and concentrated solely on spiritual needs.

E- It can readily be seen that physical activity had little place in the culture of ancient India.

INSTRUCTIONS:

After reading the above statements carefully, answer the questions given below:

a) The author offers A as a reason for B C D E None of these.

b) The author offers B as a reason for A C D E None of these.

c) The author offers C as a reason for A B D E None of these.

d) The author offers D as a reason for A B C E None of these.

e) The author offers E as a reason for A B C D None of these.
APPENDIX 4 (continued)

41. Read the following passage carefully.

(4.30)

PHYSICAL EDUCATION IN SWEDEN.

Per Henrik Ling's greatest contribution is that he strove to make physical education a science. Formerly, physical education had been conducted mainly on the premise that people believed it was good for the human body. However, many claims for physical education had never been proved scientifically. Ling approached the field with the mind of a scientist. By applying the science of anatomy and physiology, he examined the body to determine what was inherent in physical activity to enable the body to function in a more nearly optimum capacity. His efforts were directed at determining such things as the effect of exercise on the human musculature, and the various systems of the body. He believed that through such a scientific approach, he would be able to better understand the human body and its needs and to select and apply physical activity intelligently.

DIRECTIONS: Which of the following descriptions is best suited for the above passage.

A- Exercise is vital to human growth and development.

B- Per Henrik Ling's views on the role of exercise in improving organic functions in the human body.

C- Improvement of physical activity programmes is possible through scientific study.

D- Per Henrik Ling's awareness of the possibility of improving exercise programmes through scientific study.
APPENDIX - 4 (continued)

42. Read the following passage carefully.

(5.10)

IS HISTORICAL RESEARCH SCIENTIFIC?

Opinions differ as to whether or not the activities of the historian can be considered scientific or whether there is such a thing as historical research.

Those who take the negative position point out the following limitations.

A- Although the purpose of science is prediction, the historian cannot usually generalize on the basis of past events.

B- The historian must depend upon the sources which are often not valid, reliable, and objective.

C- The historian often draws inferences on the basis of incomplete information.

D- History does not operate in a closed system such as may be created in the physical science laboratory. The historian cannot control the conditions of observation nor manipulate the significant variables.

Those who contend that historical investigation may have the characteristics of scientific research activity, present the following arguments:

A- The historian delimits a problem, formulates hypotheses, or raises questions to be answered, gathers and analyzes primary data, tests the hypotheses as consistent or inconsistent with the evidence and formulates generalizations or conclusions.
APPENDIX 4 (continued)

B- Although the historian may not have witnessed an event or gathered data directly, he may have the testimony of a number of witnesses who have observed the event from different angles. It is possible that subsequent events have provided additional information not available to contemporary observers. The historian rigorously subjects the evidence to critical analysis in order to establish its authenticity, truthfulness, and accuracy.

C- In reaching conclusions, the historian employs principles of probability similar to those used by physical scientists.

D- Although, it is true that the historian cannot control the variables directly, this limitation also characterizes most behavioral research, particularly non-laboratory investigations in sociology, social psychology, and economics.

E- The observations of historians may be described in qualitative or quantitative terms depending upon the subject matter. The absence of quantitative measurement in some historical studies, however, does not prohibit (restrict) the application of scientific methodology, because the application of both quantitative and qualitative description is possible in scientific investigations.

DIRECTIONS:

Write an essay on the method of historical research. The essay may be either in favour of or against the stand that historical research is scientific.

You must not merely repeat what is given in the arguments above, but should prepare
APPENDIX 4 (continued)

your own composition based on the given points. You may illustrate the essay with examples. Try to write the essay in 2 to 4 pages.

43. The following is an account of the history of physical education in an ancient country:

This ancient country followed a policy of isolation. It did not care to associate with the rest of the world but instead, desired to live unto itself. At first, the geographical location of the country provided the necessary protection against invaders. When the mountains no longer served this purpose, walls were built around the cities; and when the walls also failed, laws were passed to keep the invaders out of the country.

The teachings of the ancient people of this country were mainly concerned with memorizing the work of their great philosopher-teacher. Individuality was suppressed, and all persons were destined to live a rigid and stereotyped existence. A studious, quiet, and contemplative life was emphasized.

DIRECTIONS:

A- On the basis of the information given above, formulate a hypothesis about the place of physical education in this country.

B- Suggest possible ways of testing the hypothesis that you have formulated.
APPENDIX 4 (continued)

SURVEYS AND CASE STUDIES:

Choose the best answer:

44. The survey method of research may be defined as:

A- a method in which data is gathered from a small sample and the individual scores are analyzed and interpreted.

B- a method in which data is gathered from a large sample and the scores are analyzed for obtaining generalized characteristics of the group.

C- a method in which data is gathered from a large sample and the individual scores are analyzed and interpreted.

D- a method in which data is gathered from the total population and the individual scores are analyzed and interpreted.

45. Describe the questionnaire method of survey briefly. (You do not have to explain the construction of questionnaire in detail).

46. Describe the meaning and purpose of the interview method of survey.

47. Given below are the titles of five questionnaire survey studies. In the space following each title indicate who will be the subjects suitable for the study. You have to name the broad population only.

TITLES:

A- Survey of Eating Habits Among Elementary School Children.

B- Survey of Socio-economic Status of Elementary School Children showing High and Low Motor Ability.
APPENDIX 4 (continued)

C- Survey of Attitudes towards Intramural Sports in the Madhav Institute of Technology and Science, Gwalior.

D- Evaluation of Physical Education Programmes in the Colleges of Madhya Pradesh.

E- Survey of Problems confronting LNCPE Alumni working in schools.

48. In a study titled, "Survey of Attitudes toward Physical Education among Laymen, Physical Education Personnel, and Physical Education Experts," whom would you consider as:

Laymen
Physical Education Personnel
Physical Education Experts

49. List the characteristics of a good questionnaire.

50. List down and explain briefly the phases or steps of questionnaire development.

51. An investigator conducted a survey of attitudes towards physical education in Bombay in the years 1980, 1981, 1982 and 1983. The graph given below shows the percentages of people reporting a positive attitude toward physical education. On the basis of the information given in the graph indicate whether the statements following the graph are true or false.

![Graph showing percentage of positive attitudes towards physical education from 1980 to 1983.]
APPENDIX 4 (continued)

A- More people had a positive attitude in 1980 than in 1981. T/F

B- More people had a positive attitude in 1981 than in 1983. T/F

C- More people had a positive attitude in 1980 than before 1980. T/F

D- More people had a positive attitude in 1983 than after 1983. T/F

52. As an investigator studying the attitude (3.00) of LNCPE students toward the examination system, construct ten questions for measuring the attitude.

53. You want to conduct a survey of parents' (4.10) self-report attitude toward sex education in Higher Secondary Schools. To accept the collected data as valid, you will have to make one important assumption. What is that assumption?

54. A student investigated the problem of determining physical fitness of people living in the city of Madras, by conducting a survey of their leisure time habits as well as interests (which they were not able to fulfill). The questions were primarily concerned with what the people would like to do most during their free time if they had a number of options. From the data obtained for an imaginary ideal condition (where people have many options) he extrapolated to the actual conditions.

DIRECTIONS:

Which of the following is an assumption implicit in using the extrapolation.
APPENDIX 4 (continued)

A- If people express the desire for participation in physical activities under ideal conditions, they are likely to actually participate even if the conditions are not ideal.

B- Ideal and actual conditions in Indian cities are one and the same.

C- The responses of people with regard to their attitude toward physical activity are more reliable if obtained under imaginary ideal conditions because at present (under the actual conditions), almost all the people have a negative attitude.

D- None of the above. The extrapolation is unjustified.

55. While giving an interview as a physical education expert, the retired principal of a physical education college presented the following argument about compulsory physical education for all college students in India.

"Everybody wants to be healthy and fit. College students know that physical education is good for their health and fitness. Even after knowing this if they don't want to participate, it is their business and not our concern. They should not be compelled to participate because compulsion causes antagonism and negative feelings which are more harmful to health than lack of exercise. Left to their own choice, most of the college students would like to participate in physical education programmes."

DIRECTIONS:

Which one of the following statements most nearly expresses the logical conclusion of the principal's argument.

A- Physical Education is not necessary for health.
APPENDIX 4 (continued)

B- Compulsory Physical Education is unnecessary as well as bad.

C- Compulsory Physical Education is bad for health.

D- Compulsory Physical Education is not necessary for health.

D- Compulsory Physical Education is either unnecessary or bad.

56. The following table presents the relationship (4.20) between the level of education of the parents and participation of their children in physical education activities. The information was obtained in a recent survey of families in Gwalior.

<table>
<thead>
<tr>
<th>Parent's Level of Education</th>
<th>Per cent of Children Participation in Phy. Edn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both Parents</td>
<td></td>
</tr>
<tr>
<td>Non-graduate</td>
<td>20</td>
</tr>
<tr>
<td>One Parent Graduate</td>
<td>30</td>
</tr>
<tr>
<td>Both Parents Graduates</td>
<td>30</td>
</tr>
<tr>
<td>One Parent Post-graduate</td>
<td>45</td>
</tr>
<tr>
<td>Both Parents Post-graduate</td>
<td>60</td>
</tr>
</tbody>
</table>

CONCLUSION:

More children of parents with higher qualifications participate in physical education than children of parents with lesser qualifications.
APPENDIX 4 (continued)

DIRECTIONS:

Which one of the following assumptions would be necessary to make the above conclusion valid.

A- Children of parents with higher qualifications had more opportunities for participation in Physical Education.

B- All children had equal opportunities for participation.

C- Many families could not send their children for participation due to poor financial condition.

D- Many children of less educated parents did not go to school at all.

57. The purpose of broad survey by questionnaire (4.30) is to obtain responses and reactions from a large number of individuals who could not be interviewed personally within a short period of time and without considerable expenditure. However, the use of questionnaire has received strong criticism. Poor questions, improper procedures, a sample that is too large or too small or inappropriate for the responses needed, or that the problem itself is too trivial (insignificant) are all reasons that have contributed to the criticism of questionnaire survey. Thus, the criticism of questionnaire survey may be less of the method itself than of the ways it is used.

DIRECTIONS:

Which one of the following is the best description of the passage given above. Indicate your answer with a tick mark.

A- The passage provides information about the uses of the questionnaire method.
APPENDIX 4 (continued)

B- The passage explains the points of criticism against the questionnaire method.

C- The passage explains the purpose of questionnaire survey and the common mistakes made in the application of this technique.

D- The passage provides information in support of the use of questionnaire surveys.

58. DIRECTIONS:
(5.10)
Given below are a number of statements related with the use of questionnaires as tools of research. Using all or some of these statements write a short essay which should be either in favour of the use of questionnaires or against their use.

A- Most of the questionnaires used in surveys are so poorly constructed that they cannot be considered valid and reliable; the questionnaires are poor with regard to coverage of the area or topic of investigation, ambiguous questions, and subjective questions.

B- By systematically outlining the field of study and developing questions that are clear, easy to answer, and objective, valid and reliable questionnaires can be developed.

C- Most questionnaire surveys deal with insignificant topics which do not make any contribution to the profession.

D- A sincere investigator can choose a topic which is relevant to the profession.

E- Most of the questionnaire surveys are conducted with an inadequate sample: a sample that is either too small or which is not truly representative of the population.
APPENDIX 4 (continued)

F- Use of proper sampling techniques can overcome the problem of an inadequate sample.

C- The percentage of returned questionnaires is usually so small that conclusions cannot be considered valid.

H- Aids to responses such as prior consent, promise of a copy of summary, follow-up etc., can be used to ensure adequate returns.

I- Questionnaires can be used only with educated people.

J- Education is a problem only in mailed questionnaires; otherwise the investigator can explain the meaning of questions to the subjects.

59. A survey was conducted to study the participation of children, from different economic backgrounds, in physical education activities. The criterion measure was the frequency of participation per week. The responses of the children are presented in the table below.

<table>
<thead>
<tr>
<th>Frequency of Participation</th>
<th>High Income Group</th>
<th>Middle Income Group</th>
<th>Low Income Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>10</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Frequently</td>
<td>15</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Occasionally</td>
<td>40</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>Never</td>
<td>35</td>
<td>10</td>
<td>35</td>
</tr>
</tbody>
</table>

How would you explain the differences in these participation rates among the three economic groups. Answer in five to seven lines.
APPENDIX 4 (continued)

In light of your explanation above, what methods would you propose for increasing the participation of children from all groups. You may give separate suggestions for each group.

60. Given below are five questions taken from (6.10) a questionnaire used by an investigator to study the attitudes of school principles towards extramural sports.

Evaluate each question carefully and point out weaknesses, if any.

A- Do you feel that each school must have an extramural programme as a part of the total extracurricular programme?

B- State your feelings about extramural sports for middle school children.

C- Do you agree that extramural sports contribute to the objectives of physical education.

D- Don't you feel that children should get a sufficient amount of competition to make them tough?

D- Do you feel that extramural sports are more important for the children.

61. The case study may best be defined as:

(1.10)
- A study of only one case to generalize the findings.
- A study of many cases to generalize the findings.
- A method of research in which the unique characteristics of an individual, a group, or an institution are studied.
- A method of research in which the typical characteristics of an individual, a group, or an institution are studied.
APPENDIX 4 (continued)

62. Indicate whether each of the following statements is: (i) a fact; (ii) an opinion or judgement, or (iii) neither a fact nor an opinion. Indicate your answer by writing F, O, or N after the statement.

A- Fifty per cent of the schools in India do not have any physical education programme.

B- Many schools in India do not have adequate physical education facilities.

C- Any school that has a good physical education programme will have more intelligent students.

D- If all schools were provided with sufficient funds, they could improve their physical education programme.

63. **Tick mark the correct statements:**

(1.20) In questionnaire development:

A- the trial run is followed by initial writing

B- the trial run comes after final writing.

C- Initial writing is followed by trial run.

64. **Tick mark the correct statement:**

(1.20) In arranging the questions in a questionnaire:

A- easy questions should be mixed with difficult questions.

B- easy questions should come after difficult questions.

C- Easy questions should come before difficult questions.
APPENDIX 4 (continued)

65. List the criteria of a good questionnaire.
(1.20)

66. An investigator is conducting a case study of gold medal winners in the National Sports Festival. In ordinary English, what is the investigator doing?

A- Trying to find if the medal winners have any characteristics in common.

B- Trying to find if the medal winners have used any unfair means.

C- Trying to find in what ways the medal winners differ from other participants.

67. An investigator studying flat feet and knock knees among school children found the distribution of students having these deformities to be as is represented by the following Venn Diagram.

![Venn Diagram]

What inference can be drawn from the above figure.

68. In a longitudinal case study of students with extremely low physical fitness, ten students were selected and given a developmental fitness programme. They were tested initially at 12 years of age and then at 13th, 14th and 15th years.

The tests were for speed, strength, and cardiovascular endurance.
APPENDIX 4 (continued)

The graph given below represents the findings of the study.

<table>
<thead>
<tr>
<th>Fitness Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

DIRECTIONS:

A number of statements are given below. Mark the statement with:

A- if the information given in the graph is sufficient for a conclusion that the statement is true.

B- if the information given in the graph is sufficient for a conclusion that the statement is false.

C- if the information given in the graph is not sufficient to draw any conclusion about the truth or falsity of the statement.

STATEMENTS:

a) Speed, Strength and Endurance developed at the same rate from 12 years to 15 years of age.

b) All the three variables were higher at 12 years of age than before that.
APPENDIX 4 (continued)

c) The improvement in speed was caused by the improvement in strength.

d) There could have been no further improvement after 15 years of age.

69. As a research expert called upon to help (3.00) in solving the problem of extremely low physical fitness in a school, how will you solve the problem by using the case study method. Give specific suggestions.

70. While defending his proposed case study of (4.10) school students who failed all the six items of the Kraus-Weber Minimum Muscular Fitness Test, a student presented the following arguments.

A- Physical fitness is an important requirement for healthful living.

B- All children must have a minimum level of fitness to live healthy and meaningful life.

C- By studying the possible causes of poor fitness. I will be able to identify the actual causes of poor fitness common to many students.

D- This study is necessary because without knowing the causes of poor fitness nothing can be done about it.

E- Therefore, I should be permitted to undertake this study.

The student offered A as a reason for B C D E None of these.

The student offered B as a reason for A C D E None of these.

The student offered C as a reason for A B D E None of these.
APPENDIX 4 (continued)

The student offered D as a reason for
A  B  C    E  None of These.

The student offered E as a reason for
A  B  C    D  None of These

71. Read the following article carefully.
(4.30)

Case Profiles of Track Athletes

by Ralph A. Vernacchia.

The general problem was to determine, by
means of case profile research techniques, the
physiological parameters and personality traits
of selected track athletes, and relationship of
these variables to performance in running.

Seven track athletes were used as subjects
and data were obtained on: (i) Biographical and
family history, (ii) Educational background, (iii)
Personality traits, (iv) Oxygen utilizing capacity,
(v) Heart rate, and (vi) Blood pressure.

Analysis of the results of the three personality
testing instruments administered to the
subjects revealed no common or shared personality
traits. Composite profiles of the three personality
tests indicated the uniqueness of each athlete’s
personality.

Results of the personal interview phase of
the study did reveal some interesting findings.
All subjects appeared to be self centered and aware
of their social, athletic, and individual needs.
In most cases they were also aware of how to fulfill
and satisfy these needs.

DIRECTIONS:

Which of the following is the best description
of the article as a whole. Indicate your
answer with a tick mark.
APPENDIX 4 (continued)

A- It shows that track athletes do not have any unique personality traits or physiological characteristics but they are unique in terms of self centeredness and awareness of how to fulfil their social, athletic, and individual needs.

B- It shows that track athletes have a unique personality.

C- It shows that track athletes do not have any typical personality traits or physiological characteristics but they are typical in terms of self centeredness and awareness of how to fulfil their social, athletic and individual needs.

D- It is a case study of track athletes showing that athletes have unique personality traits and typical self centeredness and are aware of how to fulfil their social, athletic, and individual needs.

72. A case study is to be conducted on students (5.20) who are very highly skilled. The following hypothesis has been proposed:

The students who have high levels of skill will have common characteristics of coordination, physical fitness, and intelligence.

Explain briefly how this hypothesis should be tested.

73. A physical education teacher calls you for (5.30) help in studying six elementary school children with extremely low levels of academic achievement. After conducting a case study you find that the six students have one characteristic in common—Poor Physical Fitness.

DIRECTIONS:

Consider each of the hypotheses given below in the light of your findings. If the hypothesis is not in agreement with the facts (your findings), put a tick mark against A.
APPENDIX 4 (continued)

Otherwise select the experiment which will best test the hypothesis and mark your choice with a tick.

HYPOTHESIS 1.

Poor Physical Fitness is the cause of low academic achievement.

A- Hypothesis is not in agreement with the facts.

B- Compare the academic achievement of low fitness students with the academic achievement of high fitness students.

C- Give the low academic achievers special training to improve their physical fitness and then measure their academic achievement.

D- Give the low academic achievers special tuitions to improve their academic achievement and then measure their academic achievement.

HYPOTHESIS 2.

Low academic achievement is the cause of poor physical fitness.

A- Hypothesis is not in agreement with the facts.

B- Give the low academic achievers special tuitions to improve their academic achievement level and then measure the levels of academic achievement as well as physical fitness.

C- Give the low academic achievers special tuitions to improve their academic achievement level and then measure the physical fitness.

D- Give the low academic achievers special training to improve their physical fitness and then measure their academic achievement.
APPENDIX 4 (continued)

74. An investigator conducted a case study of the family backgrounds of four gold medal winners in swimming (National level). He obtained data on socio-economic status of the families, level of education of all family members, sports achievements of all family members, dietary habits of the swimmers, and training schedules.

He felt that the high achievement was the result of the combined effects of heredity, dietary habits, and training. On the other hand, his advisor felt that the swimmers had won the gold medals because of training and luck.

DIRECTIONS:

Examine the conclusions given below. Which one of the conclusions do you think is justified. Indicate your answer with a tick mark.

CONCLUSIONS:

A- More information is needed to determine the causes of medal winning performance of the swimmers.

B- The investigator is correct; the performance was the result of heredity, dietary habits, and training.

C- The advisor is correct; the performance was the result of training and luck.

DIRECTIONS:

Some statements are given below. Write against the statements alphabet -

A- if the statement explains why your conclusion is logical.

B- if the statement does not explain the logic of your conclusion.
APPENDIX - 4 (continued)

C - if you are unable to decide about the statement.

STATEMENTS:

1. High performance in swimming requires a particular type of body build which is the result of heredity.

2. Diet is an important factor in swimming performance.

3. The investigator did not obtain data on the body build of the swimmers, hence it cannot be considered as a contributing factor.

4. Training is the only factor that influences performance.

5. Luck is the main factor that determines performance.

EXPERIMENTAL RESEARCH:

75. Define the following:
(1.10)
A - Experimental Research.
B - Independent Variable.
C - Dependent Variable.
D - Extraneous Variable.

76. John Stuart Mill is recognized for:
(1.10)
A - The law of single variable.
B - Having developed the concept of hypothesis testing.
C - The law of parallelogram of forces.
D - Identifying extraneous variables.

77. R.A. Fisher was the first research worker:
(1.10)
A - to be given the Noble Prize.
B - to be penalized for his revolutionary ideas.
APPENDIX 4 (continued)

C- to provide an effective method for research involving more than one independent variable.

D- to develop the repeated measures design.

78. In experimental research, variables are usually termed as:

A- Effective and Ineffective.
B - Negative and Positive.
C- Useful and useless.
D- Independent and Dependent.

79. Given below are diagramatic representations (1.20) of some experimental designs. Write below each diagram which experimental design it represents.

A- PRE TEST - TREATMENT I - POST TEST (Group I)

PRE TEST - TREATMENT II - POST TEST (Group II) or CONTROL

B- TREATMENT B₁ TREATMENT A₁ TREATMENT A₂
   TREATMENT B₂
   A₁ B₁ A₂ B₂
   A₁ B₂ A₂ B₂

C- PRETEST - TREATMENT - POST TEST

D- PRETEST - TREATMENT I - POST TEST I → TREATMENT II - POST TEST II

E- TREATMENT I - TEST
   TREATMENT II - TEST
   TREATMENT III - TEST
   TREATMENT IV - TEST
APPENDIX 4 (continued)

80. We want to know whether eating "ghee" (purified butter) improves strength or not. To find this we should -

A- Study what the ancient books on Ayurveda say about this.

B- Select 20 strong boys and check if they eat ghee.

C- Select 20 boys who eat ghee regularly and 20 boys who do not eat ghee and compare the strength scores of the two groups of boys.

D- Perform an experiment with two groups of students; one group is given ghee everyday and the other group is given an ordinary diet. After two months the strength scores of the two groups are compared.

81. In experimental research if all other relevant factors are kept constant, reliability of the findings can be increased by.

A- Increasing the duration of the experiment.
B- Increasing the size of the sample.
C- Drawing a purposive homogenous sample.
D- None of the above procedures.

82. Given below are the tabulated results of an experimental study titled, "Effect of Vitamin B Complex on Physical Fitness."

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-test Mean</th>
<th>Post-test Mean</th>
<th>Difference Between Means</th>
<th>t-ratio</th>
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</thead>
<tbody>
<tr>
<td>Experimental</td>
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<td>55</td>
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<tr>
<td>Control</td>
<td>44</td>
<td>52</td>
<td>8</td>
<td>2.9*</td>
</tr>
</tbody>
</table>

*Significant at .05 level.
APPENDIX 4 (continued)

DIRECTIONS:

Out of the conclusions given below, indicate which ones are consistent with the results given in the Table and which ones are not consistent by placing a tick mark or a cross (x) in the space provided after each conclusion.

CONCLUSIONS:

A- Administration of Vitamin B - Complex improves physical fitness.

B- Physical Fitness improves even without extra Vitamin B - Complex.

C- There is no difference in physical fitness improvement resulting from Vitamin B-Complex and the natural (normal) improvement.

D- Vitamin B-Complex causes more improvement in Physical Fitness than ordinary diet.

83. Given below are some experimental research titles. Study each title carefully and suggest the experimental design which will be most appropriate for the study.


Design:

B- Effect of a six-week Circuit Training Programme on Cardio-vascular Endurance of High School Boys.

Design:

C- Interactive Effects of Strength Training and Dietary Protein supplements on Strength of College Men.

Design:
APPENDIX 4 (continued)

D- Comparative Effects of Different Durations (10, 15, 20 minutes) of Warm-up on Basketball Skill Test Scores.

Design:

84. Read the following passage carefully, and (4.10) answer the subsequent questions.

Early forms of experimental research were based on the law of the single variable. This law stated that if two situations are alike in every respect, and one element is added to one but not the other, any difference that develops is the result of the added element. Although the concept of the single variable proved useful in some areas of the physical sciences, it failed to provide sound method for experimentation in the behavioral sciences.

DIRECTIONS:

The above passage concludes that the law of the single variable failed to provide a sound method for experimentation in the behavioral sciences. From the list given below, select the assumption that is necessary to make this conclusion valid.

A- Behaviour cannot be measured like physical variables such as weight, speed, etc.

B- Behaviour comprises of many reactions which are independent of each other and do not form a unitary construct.

C- Behaviour is influenced by many variables.

D- The law of the single variable is faulty in itself.

85. Read the following passage carefully.

(4.20) Experimentation is the most sophisticated, exacting, and powerful method for discovering and developing an organized body of knowledge.
APPENDIX 4 (continued)

It provides a method for hypothesis testing under known conditions where as many extraneous variables as possible are controlled, careful and critical observations are made, and the effect of the independent variable is studied.

DIRECTIONS:

Which of the following statements is least inconsistent with the description of experimental research given above.

A- Experimentation is a sound method for studying the effect of a single variable or many variables.

B- Experimentation is a poor method for behavioral research.

C- Experimentation cannot contribute to the existing body of knowledge because it always goes against established facts.

D- The findings of experimental research cannot be applied in real life situations.

86. Write a unified brief essay on "The Experimental Method of Research." The essay must include the concepts of the control of extraneous variables and establishing cause-effect relationships. You may give suitable examples.

87. An investigation was conducted to study the effect of different types of pre-test meals on performance in an all out run on the treadmill at 10 km./hr. Score in the test was the maximum duration for which the subject could run at that speed. Results of the study are presented below in tabulated form.
TABLE

AVERAGE SCORES IN THE ALL-OUT RUN AT 10 KM./HR.

<table>
<thead>
<tr>
<th>Diet</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>'t' ratio</th>
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<td>7</td>
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<tr>
<td>High Carbohydrate Diet</td>
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<td>3.50*</td>
</tr>
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</table>

*Significant at .05 level.

DIRECTIONS:

How would you explain the difference in performance with different types of pre-test meals.

In the light of your explanation, what suggestions do you give for improving performance in all out runs like - 12 min. Run/Walk test, 5000 M. Run, etc.

88. While teaching high jump to his 7th grade (5.30) students, a teach made the following observations:

a) The students exhibited maximum improvement when he (the teacher) frequently demonstrated the correct style, told the students exactly what was wrong with their style during practice, and suggested ways of correcting the errors.

b) The students exhibited little improvement when he (the teacher) demonstrated only once, just told the students that their style was either wrong or correct, and gave no suggestions for improvement.

DIRECTIONS:

Consider each hypothesis given below in the light of the observations made by the teacher. If the hypothesis is untenable
APPENDIX 4 (continued)

(not in agreement with the observations) or cannot be tested experimentally, mark A. Otherwise mark the experiment which will be the best for testing the hypothesis.

HYPOTHESIS 1.

Frequent demonstrations are necessary for learning High Jump.

A- Hypothesis is not tenable or cannot be tested experimentally.

B- Give a pre-test to two samples of 7th class students, teach them with frequent demonstrations, and give a post-test to see if they improve their style and performance.

C- Give a pre-test to two samples (groups) of 7th class students, teach one group with frequent demonstrations and the other group with only one demonstration, and finally give a post test to both the groups. Compare the improvements made by the two groups.

D- Take all the students of 7th class to an athletics meet where they observe many high jumpers. See if this improves the performance of the students.

HYPOTHESIS 2.

The students of 7th class whom the teacher was teaching are slow in learning.

A- Hypothesis is not tenable or cannot be tested experimentally.

B- Obtain motion pictures of the students while performing the high jump and show them to three experienced coaches. Ask the coaches if the students look slow in learning.
APPENDIX 4 (continued)

C- Measure and compare the motor ability of the 7th class students with 6th and 8th class students.

D- Try to teach high jump to a different class by the same method which was used for 7th class students and see if these new students also exhibit similar responses.

HYPOTHESIS 3

There are three requirements for learning high jump: frequent demonstrations, knowledge of results in specific terms, and suggestions for correction of mistakes.

A- Hypothesis is not tenable or cannot be tested experimentally.

B- Conduct an experiment with a 2x2x2 factorial design.

C- Conduct an experiment with a random group design using 30 groups \[ n \cdot (n-1) = 30 \]

D- Conduct an experiment with a repeated measures design.

19. During the colloquium for MPE III Semester 6.10 students, one student proposed the following study:

"Comparative Effects of Two Training Schedules on the Learning of Football Skills."

The schedules were:

a) Daily practice for one hour.

b) Practice on alternate days for one hour.

The student wanted to use the related group design for his study. However, the Research Committee felt that a random group design would be better.
APPENDIX 4 (continued)

DIRECTIONS:

Examine the conclusions given below. Which one of the conclusions do you think is justified.

CONCLUSIONS:

a) Random group design is better for this study.

b) Related group design is better for this study.

c) More information is needed about the factors that influence learning of football skills before a decision could be made.

DIRECTIONS:

Given below are some statements related with the above example. Mark the statements as follows:

A - if the statement explains why the conclusion you have chosen is logical.

B - if the statement does not explain why the conclusion you have chosen is logical.

C - if you are unable to decide about the statement.

STATEMENTS:

1. The Research Committee is supposed to have adequate knowledge of research methodology and therefore its opinion carries more weight.

2. Skill learning in football does not depend upon the characteristics of the subjects but on the schedule of practice.
APPENDIX 4 (continued)

3. Skill learning in football depends on a large number of variables and to equate groups on all these variables would be practically impossible.

4. If two samples are drawn randomly from the same population, they will differ only within the limits of normal probability, i.e., the difference will not be statistically significant.
APPENDIX 5

PER CENT SCORES IN TAXONOMICAL CATEGORIES AND SUBCATEGORIES

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