APPENDIX-B

QUESTIONNAIRE AND OPINIONNAIRE
FOR MATHEMATICS TEACHERS

Dear Colleagues,

Few questions and statements are given in this form to obtain information about mathematics teaching in secondary schools. You are requested to fill this form with all intellectual honesty expressing your own feelings. The information obtained shall be utilised for the preparation of a Ph.D. thesis. Without your sincere cooperation, it is impossible to achieve success. Please respond to every question or statement. Your personal response is invited.

Thank you for your cooperation.

Yours faithfully

BIJAYALAXMI DAS
TG T (MATHS)
SECTION-1

1 Name of the School : 

2 Address : 

3 Location : Urban / Rural 

4 Type of School : A - Boys/Girls/Co-Educational  
                 B - Govt./Aided/Unaided/Private 

5 Year of Establishment : 

6 Total No.of Classes (with sections) 
   i) VI to VIII  
   ii) VI to X  
   iii) VI to XII 

7 Total No.of Students in your school: 

8 Total No.of teachers in your school: 
   a) No.of Post Graduate trained teachers 
   b) No.of Graduate Trained Teachers 

9 No.of teachers with : 
   a) M.A / M.Sc. in Mathematics 
   b) B.A / B.Sc. with Honours in Mathematics 
   c) B.A / B.Sc with Mathematics (Pass) 

10 Total No.of Mathematics Teachers of your School 
    teaching mathematics in Class VIII, IX, X 

11 Proportion of teachers to students : 

12 Name & Age and experience of Mathematics Teacher 
   who fills this questionnaire. 

13 How many students of your school have qualified 
   in the National Talent Search Examination with 
   Mathematics as a subject ?
SECTION-II(a)

(put a tick mark (✓) over the correct answer.
Give briefly the reasons for your answer, wherever necessary)

1  Do you teach mathematics according to the methods you have learnt in your teacher training institution?
   a) Always
   b) Sometimes
   c) Never

2  If not, what is your difficulty? Some reasons are given below. Please tick the appropriate ones. Add other reasons if you have:
   a) Lack of motivation
   b) Lack of time
   c) Unsuitable topic
   d) Lack of students participation
   e) Constraints of examination
   f) Lack of ancillary facilities

3  Do you read reference books? YES / NO

4  Do you read Mathematical Journals? YES / NO

5  Do you solely depend on the prescribed text books for class room participation? YES / NO

6  Is your teaching affected by:
   a) Lesser No.of periods per week
   b) Short period
   c) Reduction in the number of working days
   d) Lengthy syllabus
   e) Over work

7  During teaching, do you emphasize some problems which are generally set in the examination? YES / NO

8  During teaching, do you look to the understanding of all the students? YES / NO

9  Do you have sometime outside the school hours for preparation of lesson for the class and see the homework YES / NO

10 Do you teach your students the skill of drawing mathematical charts and maps? YES / NO
11 Do you teach your students the skill of drawing mathematical charts and maps? YES / NO
12 Do you perform geometrical constructions in the class? YES / NO
13 Do you encourage your students to prepare mathematical models? YES / NO
14 Do you regularly see home work? YES / NO
15 If you do not see the homework, what are your difficulties? (please write in brief)
16 When do you give class room tests?
   a) After completion of the topic
   b) Weekly
   c) Half yearly
   d) Yearly
17 Do you give importance to the marks secured by the students in class examinations? YES / NO
18 Do you like to set questions in conformity with the objectives of teaching mathematics at the secondary stage? YES / NO
19 Do you set questions similar to the questions set by C.B.S.E.? YES / NO
20 For what purpose do you make use the examination results?
   a) For awarding promotion
   b) For improving syllabus
   c) For improving teaching methods
   d) Any other purpose, please mention
21 Do you give appropriate weightage to different content areas in setting question? YES / NO
22 Performance of candidates in CBSE Examination is poor in Mathematics in comparison to other subjects. Please mention some of the reasons:
SECTION-II(b)

METHODS IN TEACHING MATHEMATICS

ANALYTIC METHOD – A  DEDUCTIVE METHOD – D
SYNTHETIC METHOD – S  LECTURE METHOD – L
INDUCTIVE METHOD – I  PROBLEM SOLVING METHOD – P
TEACHER’S ECLECTIC METHOD – E

1 Write down suitable method/methods of teaching the following topics in symbols as given as above:

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>METHOD</th>
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<tbody>
<tr>
<td>(a) Real Numbers</td>
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<tr>
<td>(b) Function and Graph</td>
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<tr>
<td>(c) Angle Relation</td>
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<td>(d) Surds</td>
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<td>(e) Congruent Triangles</td>
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<td>(f) Polynomials</td>
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<td>(g) Parallelograms</td>
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<td>(h) Factoring a Polynomial</td>
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<td>(i) Linear Equations in one variable</td>
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<td>(j) Loci and concurrency theorems</td>
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<td>(k) Logarithms</td>
<td></td>
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<tr>
<td>(l) Area (Theorems &amp; Applications)</td>
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<tr>
<td>(m) Geometrical Constructions</td>
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<tr>
<td>(n) Trigonometry</td>
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<td>(o) Computing</td>
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<td>(p) Statistics</td>
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<td>(q) Mensurations</td>
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<td>(r) Circle (Theorems &amp; Applications)</td>
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</table>

SECTION-III(a)

Put a tick mark over the correct answer or write briefly your own answers wherever necessary.

1 Do you construct a formula with the help of sufficient number of examples? YES / NO

2 Do the students participate actively in the discovery of mathematical facts and formula YES / NO
3 Do you use experimentation to teach mathematical facts and formulae? YES / NO
4 Do you think inductive method is suitable to teach:
   a) Algebra? YES / NO
   b) Geometry? YES / NO
   c) Modern Algebra? YES / NO
   d) Arithmetic? YES / NO
   e) Commercial Mathematics? YES / NO
   f) Statistics? YES / NO
5 Do you think Inductive Method is the most suitable method for the syllabus of:
   a) Class - VII? YES / NO
   b) Class - VIII? YES / NO
   c) Class - IX? YES / NO
   d) Class - X? YES / NO
6 Do you find any advantage of Inductive Method of teaching? (kindly mention some reason) YES / NO
7 Do you find any drawback of Inductive Method of teaching? (kindly mention some) YES / NO
8 How often Inductive Method is useful in teaching?
   a) Always
   b) Sometimes
   c) Never

SECTION-III(b)
1 Do you proceed from formulae to examples? YES / NO
2 Do you ask the students to work out sums as per the established formulae? YES / NO
3 Do you explain the application of formulae by working out the sums on the blackboard? YES / NO
4 Do you give problems as homework in order to memorize and enable the students understand the utility of the formulae?

5 Do you use Deductive Method of teaching Mathematics?

6 Do you think Deductive Method is suitable to teach:
   a) Algebra?
   b) Geometry?
   c) Arithmetic?
   d) Modern Algebra?
   e) Commercial Mathematics?
   f) Statistics?

7 Do you think Deductive Method of teaching is most suitable method for the syllabus of:
   a) Class - VII?
   b) Class - VIII?
   c) Class - IX?
   d) Class - X?

8 Do you find any drawback in Deductive Method of teaching? (mention some of them)

9 Do you find any advantage in Deductive Method of Teaching? (mention some of them)

SECTION-III(c)

ANALYTIC METHOD

1 Do you start a problem with what is to be found out?

2 Do you start solving a problem from unknown to known?

3 Do you analyse the statement of the problem in order to get the solution?
4 Do you get solution by questioning at each and every step?  
5 Do you enable the students to discuss Mathematical facts?  
6 Is it necessary to give reasons and justification in each and every step while solving a problem?  
7 Do your students face questions like 'How to prove?' 'How to simplify?' at each step in solving the problem?  
8 Is it possible to teach all topics in 'Analytic Method' of teaching Mathematics?  
9 How do you feel about 'Analytic Method' of teaching Mathematics?  

Ans:  

10 Is this method of teaching time consuming?  
11 How often you use 'Analytic Method' of teaching Mathematics?  
   Always, Most of the time, Sometimes, Occasionally, Never  
12 In which class and which branches of Mathematics, it is most useful?  
   Class:  
   Branches of Mathematics:  

SECTION-III(d)  
SYNTHETIC METHOD  

1 Do you proceed from known to unknown?  
2 Do the students need to remember the trick of solving a problem?
3 Do you encourage students to discuss their own methods of solving mathematical problems?

4 Do you put stress on remembering the process of solving mathematical problems?

5 Do you justify with proper reason each and every step in teaching?

6 Is it possible to give proper explanation in each and every step of your teaching?

7 Do the students get full satisfaction in 'Synthetic Method' of teaching?

8 Is 'Synthetic Method' of teaching time consuming?

9 Is it possible to teach all topics in Synthetic Method of teaching?

10 Which is the best method of teaching Mathematics according to your views?

Ans:

11 Do the worked out sums given in the Text Book give any hints of method of teaching?

SECTION-IV(a)

A number of statements collected from a variety of sources are given below. Please indicate your degree of agreement or disagreement with each statement in symbols:

Strongly Agree .. S.A.
Agree .. A
Undecided .. U
Disagree .. D
Strongly Disagree .. S.D.
IV(a) SOME EFFECTIVE BEHAVIOURS OF TEACHERS

1 Alert, appears enthusiastic
2 Appears interested in pupils and classroom activities
3 Cheerful, Optimistic
4 Self-controlled, not easily upset
5 Likes fun, has a sense of humor
6 Recognises and admits own mistakes
7 Is fair, impartial and objective in treatment of pupils
8 Is patient
9 Shows understanding and sympathy in working with pupils
10 Is friendly and courteous in relations with pupils
11 Helps pupils with personal as well as educational problems
12 Commands effort and gives praise for work well done
13 Accepts pupils efforts as sincere
14 Anticipates reactions of others in social situations
15 Encourages pupils to try to do their best
16 Classroom procedure is planned and well organised
17 Classroom procedure is flexible with overall plan
18 Anticipates individual needs
19 Stimulates pupils through interesting and original materials and techniques
20 Conducts clear, practical demonstrations and explanations
21 Is clear and thorough in giving directions
22 Encourages pupils to work through their own problems and evaluates their accomplishments
23 Disciplines in quite, dignified and positive manner
24 Gives help willingly
25 Forsees and attempts to resolve potential difficulties

IV(b) SOME RULES FOR THE DEVELOPMENT OF GOOD CLASS MORALE

1 Good grooming, enthusiasm and warmth are important in making a good first impression.
2 Class should begin on time and close on time.
3 Teacher should be alert in stopping the little disturbances.
4 Teacher should be tactful in dealing with the students (requests rather than commands, cooperative discussions, courtesy rather than curtness are some of the essence of tact)
5 Teacher should radiate good humor can even disposition and peace of mind in face, voice and actions
6 Avoid hasty judgements, partiality or prejudicial treatment in working with students
7 Expect good behaviour and insist on it
8 Be consistent in behaviour
9 Teacher should not fail in leadership
10 Avoid uncompromising situations, public argument, sarcasm
IV(c) TEACHER REACTION TO STUDENTS RESPONSE

Symbol

1. Show appreciative attitude toward student response
2. Interpret sincere response to advantage of student
3. As a rule, students should not be assisted in response

IV(d) - TEACHER REACTION TO STUDENT QUESTIONS

1. Student question should be encouraged
2. Insist that questions be significant
3. Require courtesy in questioning
4. Grant earnest student right to question your position
5. When teacher cannot answer questions, frankly say so.

SECTION-V(a)

INculcating Love for Mathematics

1. Teacher should try to gather experience by continual study of books, reports and discussions
2. The teacher should seek inspiration from the cultural, historical and recreational aspect of his subject
3. In order to win good emotional response from his pupils, the teachers approach needs to be sympathetic and encouraging.
4. The teacher should see that there is genuine learning and not mere memorization by rote
Constructive and sympathetic school report on the pupils progress in Mathematics helps to evoke the fruitful emotional response.

V(b) - SKILLS IN TEACHING

1. Introducing a new topic in an interesting manner

2. Every teacher must know the technique of questioning very thoroughly

3. In case of wrong answers given by students the teacher should deal in such a way that it keeps the student thinking actively and enables him to arrive at the correct solution.

4. Immediate repetition of taught material is extremely important for maximal learning

5. A teacher who is lively is able to establish rapport with his students very quickly

6. How the lesson is closed leaves a lasting impression on the students

7. The students must be given some home task or some assignment or project on the topic that has been dealt with.

SECTION-V(c)

TEACHERS ATTITUDE

1. The teacher should have a love of his subject.

2. The teacher should be able to command his pupil's respect which can be achieved through his knowledge of the subject

3. Teachers qualification should be as high as possible
The teacher should have adequate class control

Teachers written work should be arranged properly

Teachers explanation require much ease and patience

SECTION-V(d)

MENTAL WORK

Mental work should be encouraged to shorten written work

Mental work should be of such type where accuracy is not disrupted

VI - ACHIEVING DISCIPLINE

PENALTIES APPLICABLE IN DISCIPLINARY CONTROL

1. Kindness and Sympathy
2. Loss of privilege
3. Same treatment as the offense to the offender
4. Placed on honour or probation
5. Parents assistance
6.Handled by board
7. Extra work
8. Lecture
9. Ridicule
10. Expulsion
11. Reprimand
12. Failure in work
13. Ignoring
14. Teachers resignation
SECTION-VII

MEMORY WORK

1. Students should be encouraged to memorize every relevant and familiar concepts, rules or formulae in Mathematics.

2. They should not be encouraged to memorize formulae without understanding.

3. Students memory of the earlier work should be strengthened by reviewing it periodically.

VIII - WRITTEN WORK STATEMENT

1. Essential features of a geometrical figure can be drawn coloured. The frame work being left white.

2. There should be written application of every new work by the pupils during the same lesson.

3. Written work brings to light difficulties unsuspected by the teacher.

4. Accuracy of the written work should be encouraged among pupils.

5. Neatness and methodical arrangement have a practical as well as aesthetic value.

6. Rough work should be shown along with the answer (may be at the side of the main working).
SECTION-IX(a)

TECHNIQUES FOR MOTIVATION

1. Set up a definite purpose for each class period
2. Use a variety of learning activities, methods and materials
3. Encourage wider student participation
4. Place more responsibility on students for their own learning
5. Keep students informed of their progress
6. Relate school work to the world in which we live
7. Set up learning situations where every student may experience some degree of success
8. Establish an environment that is attractive and comfortable
9. Show enthusiasm for the subject he teaches
10. Try to fit homework and assignment to the needs and capabilities of each
11. Build both group and individual esprit de corps
12. Teacher should not overlook home influences
13. Keep in mind that as a motivational force peer group approval is more effective than teacher imposed pressure
14. Intrinsic incentives such as competition, rewards, praise and reproof can be effective supplementary instructional tools.
SECTION-IX(b)

HOME WORK

1. Home work in Mathematics serves the purpose of giving training in working without help.
2. Practice of parents helping pupils with home work should be discouraged.
3. Home work should be of such type, the pupils are able to do most of the work successfully.
4. While giving homework, varying speeds of pupils should be kept in mind.

SECTION-IX(c)

REVISION

1. Revision in the sense of review of work previously done, should always be purposeful, and for this reason need not be confined to specific periods of the school year.
2. Revision should be purposeful.

X(a) TECHNIQUES OF CLASS QUESTIONNAIRE

1. Address questions to class before designing one to respond it.
2. Distribute questions as far as possible to members of class evenly.
3. Allow sufficient time for the formulation of answers.
4. Ask questions in such a manner as not to suggest the answer.
5. Assume students to be correct when he indicates inability to answer question.
6. Organise questions around pivotal ideas.
As a rule do not repeat questions
As a rule do not repeat answers
Occasionally ask questions of the inattentive
Question should be asked in easy confident manner

SECTION-X(b)
TESTS AND EXAMINATIONS
1 Testing should be purposeful
2 Questioning is the most purposeful weapon to bring to light weak points in pupils Mathematical knowledge
3 By questioning proof of geometrical theorems can be given easily
4 Questioning help students to contribute their ideas freely

SECTION-X(c)
ASSESSMENT, MARKING AND CORRECTION STATEMENT
1 Teacher should examine books (or a selected number of them) as soon as possible after new work has begun.
2 The teacher should move round among the class while written work is being done, paying particular attention to the known untidy pupils
3 Pupils of lowest standard can be encouraged by awarding one mark or grade for attainment and another for effort
4 Pupils should be encouraged to find and correct their own mistakes wherever possible.

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