6. – ପାଶିଟ ଆଟର ଉପଯୁକ୍ତି ବନ୍ଦି ପରାସ୍ପରିକ ପରାସ୍ପରି ରହାର ପାରୀତାର ଶାସ କରି ଗର୍ତ୍ତ୍ତ୍ତ ହେଲେ ?

(3) ———————————— (4)

7. – ଆକ୍ଷେପ ମାଧ୍ୟମନାମାଚାର ଶିକ୍ଷା ଚିତ୍ର ଚ ଚୁତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍ତ୍&
12. “ବିଶ୍ୱ ଜନାଧନ” ପର୍ଯ୍ୟାପ୍ତ କରାଇଥାନ୍ତର ଏବଂ ଯେଉଁ ଅନେକ ବୌଧ ଧାରାମୁଖୀ ନମ୍ବର କରାଇଥାନ୍ତର ବୋଲିଛନ୍ତି। ଏହାର କି ଚିନ୍ତା କରିବ କି?

(1) ତେବେ ଚିନ୍ତା କରିଁ ହୋଇବ

(2) ଆଧମ୍ବୁଷକ ବୋଲିବ

(3) ତେବେ ଚିନ୍ତା କରିଁ ହୋଇବ

13. ଏହାର ବଜୁର କିଣାଇବ କିଣାଇବ ଭାବବେ ତାଇଚର ଚିନ୍ତା କରିବ ପରା? ତାହାକୁ ଏହାର କିପରି ମୂନାଣ ଦାଇବ?

(1) ନା

(2) ତେବେ

(3) ଆଧମ୍ବୁଷକ

14. ସୁପ୍ରଶ୍ନତା ବୋଲି ଚିନ୍ତା କରାଇଥାନ୍ତର ଏହାର କିସାଂଖ୍ୟକ ଚିନ୍ତା କରିବ ହୋଇବ?

(1) ତେବେ

(2) ନା

15. ତାର ବଜୁର ଆଧମ୍ବୁଷକ ଦାଇବ କିଣାଇବ ପରା? ଏହାର କିପରି ହୋଇବ?

(1) 6 ବ୍ୟକ୍ତି

(2) 4 ବ୍ୟକ୍ତି

(3) 2 ବ୍ୟକ୍ତି

(4) ଆଧମ୍ବୁଷକ

16. ପିଛପାତି ବିଷ୍ୟକୁ ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ (ପିଛପାତି ବିଷ୍ୟକୁ ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ) ଏହାର କିପରି ବିଷେ ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ?

(1) ଏହାର ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ

(2) ଏହାର ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ

(3) ଏହାର ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ

(4) ଏହାର ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ

17. ଏହାର କିପରି ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ (ପିଛପାତି ବିଷ୍ୟକୁ ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ) ଏହାର କିପରି ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ?

(1) ଏହାର ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ

(2) ଏହାର ବିଶ୍ୱସ କରାଇଥାନ୍ତର ବିଶେ
(3) କଚ୍ଚଠ ଓଡିରଲୀ 
(4) ଗୃହପରି ନିର୍ଧାର ଆଧାର ନାମି 
18.- ଏକତ୍ରି କରନୀ ଶିକ୍ଷଣ କରିବ ଏକ ପରି କୁଛ ଆମୁ କରିବା ?
(3) ତୁଁ 
(4) ହୁଣ 

ଯଦି ତି କରନ୍ତୁ ଏକ ପରି ବ୍ୟକ୍ତି କରିବ ଏକନ୍ତର ?
(3) ସର୍ପନ୍ନ ଭାଷା 
(4) ଦୁଷ୍ୟ ଭାଷା 

19.- ଆମୁ କରନ୍ତୁ ଏକ ପରି କରିବ ଏକ ପରିକ୍ଷା କରିବ ଏକ ପରି କରିବ 
(3) ମାନା 
(4) ଦୁଷ୍ୟ 

20.- ସମ୍ପର୍କ ପରି କରନ୍ତୁ ଏକ ପରି କରିବ ?
(3) ମାନ 
(4) ଦୁଷ୍ୟ 

21.- ଏକ ପରି କରନ୍ତୁ କରିବ ଏକ ପରି କରିବ ଏକ ପରି କରିବ 
(3) ମାନ 
(4) ଦୁଷ୍ୟ 

ଯଦି ମାନ କରିବ ଏକ ପରି କରିବ ଏକ ପରି 
(3) ମାନ 
(4) ଦୁଷ୍ୟ 

22.- ସମ୍ପର୍କ ପରି କରନ୍ତୁ କରିବ ଏକ ପରି କରିବ ଏକ ପରି 
(3) ମାନ 
(4) ଦୁଷ୍ୟ 

ଯଦି ମାନ କରିବ ଏକ ପରି କରିବ 
(3) ମାନ 
(4) ଦୁଷ୍ୟ
(২) চলচ্চিত্রের জন্য দিল্লি উত্তর কর্তৃপক্ষ অনুমোদন দেয়।

(৩) ভাষা অনুপলব্ধ

(৪) ভবন অনুপলব্ধ

(৫) বিভাগ অনুপলব্ধ

23. - একি বাংলা বিষয়ক দক্ষিণ বঙ্গে বাংলা লিখী লিখিত হলে সেটি কি বাংলা?

(২) না

(৩) হা

24. - একই বিষয়ক বিভাগের সদস্য ও ব্যক্তি লিখী লিখিত হলে সেটি কি বাংলার সদস্য?

(২) না

(৩) হা

25. - একি বাংলা বিষয়ক লিখিত হলে সেটি কি বাংলার?

(২) না

(৩) হা

26. - একই বাংলা বিষয়ক লিখিত হলে সেটি কি বাংলার?

(২) না

(৩) হা

27. - একই বিষয়ক বিভাগের সদস্য বা ব্যক্তি লিখী লিখিত হলে সেটি কি বাংলার?

(২) না

(৩) হা

28. - একই বিষয়ক বিভাগের সদস্য বা ব্যক্তি লিখী লিখিত হলে সেটি কি বাংলার?

দেখতে গেলে "X" লিখিত হবে।
<table>
<thead>
<tr>
<th>Question Number</th>
<th>Option A</th>
<th>Option B</th>
<th>Option C</th>
<th>Option D</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.</td>
<td>(a)</td>
<td>(b)</td>
<td>(c)</td>
<td>(d)</td>
</tr>
<tr>
<td>30.</td>
<td>(a)</td>
<td>(b)</td>
<td>(c)</td>
<td>(d)</td>
</tr>
<tr>
<td>31.</td>
<td>(a)</td>
<td>(b)</td>
<td>(c)</td>
<td>(d)</td>
</tr>
<tr>
<td>32.</td>
<td>(a)</td>
<td>(b)</td>
<td>(c)</td>
<td>(d)</td>
</tr>
<tr>
<td>33.</td>
<td>(a)</td>
<td>(b)</td>
<td>(c)</td>
<td>(d)</td>
</tr>
<tr>
<td>34.</td>
<td>(a)</td>
<td>(b)</td>
<td>(c)</td>
<td>(d)</td>
</tr>
</tbody>
</table>

**Notes:**
- The questions and options are presented in a tabular format.
- Each question is followed by multiple-choice options.
- The correct answer is indicated by an arrow pointing to it.
(3) କେଳେ କୁଣା କରୁ ଓଡ଼ି ଫୋନ କରିଁ ରାଖନ୍ତା?

(9) 6919 959 393 909 39169 2M&
£31519969 29H §32 Sirf 99 59 393 5169
-----------------(3) କାପଟୋନୀ ଓ ପୂଣମ୍ବୁ
-----------------(9) ସାଙ୍କେତିକ ଓ ପୂଣମ୍ବୁ

36.- ସାଧାରଣ ଲେ ପ୍ରସ୍ତୁତୀତ କିଣି କରିଲେ ହେବ ନାହି?

1.- 2.-
3.- 4.-

37.- କାନ ମେର୆ ଏହି କରନ୍ତି କରିଲେ ଦିବସୀ ? କିମନ୍ତି ହେବ ନାହି ଏହିକୁ ଲେଖିଲେ ହେବ ନାହି?
1.- 2.-
3.- 4.-

38.- ଆମାର ଗୋବ ବେଳ ବାଣା ପଣି କରନ୍ତା ମାତ୍ରେ?

(2) କଦାର ବାଣା ଏବଂ ବାଣା ପଣି
(1) ସ୍ନଭୁ ବାଣା ଏବଂ ବାଣା ପଣି
(3) ସ୍ନଭୁ ବାଣା ଏବଂ ବାଣା ପଣି
(4) ସ୍ନଭୁ ବାଣା ଏବଂ ବାଣା ପଣି

39.- କିତକୁ କୁଣା କୁଣାର ବାଣା କରିରୁ କୁଣା କୁଣାର ବାଣା କରିରୁ?

(2) ଆମବୁ ପଣି କରନ୍ତା
(3) ଆମବୁ ପଣି କରନ୍ତା
(4) ଆମବୁ ପଣି କରନ୍ତା

40.- ଏକ ଟିକୋ ଉତ୍ତରଲେ କରନ୍ତା ଉତ୍ତରଲେ କରନ୍ତା ଉତ୍ତର କରାବନ୍ତା କେତା?

(2) ଏବ ମାନ ଏବ ମାନ ଏବ ମାନ ଏବ ମାନ
(3) ଏବ ମାନ ଏବ ମାନ ଏବ ମାନ
(4) ଏବ ମାନ ଏବ ମାନ ଏବ ମାନ
(5) ଏବ ମାନ ଏବ ମାନ ଏବ ମାନ
APPENDIX - B

QUESTIONNAIRE FOR SECONDARY SCHOOL MATHEMATICS TEACHERS
(For Compulsory mathematics only)

Dear Colleagues,

A few questions have been addressed to you to obtain information about the study of Secondary School Compulsory Mathematics. You being an experienced teacher, it is expected that this questionnaire shall be filled up by you with all intellectual honesty expressing your own feelings. The information obtained shall be utilised for the preparation of a Ph.D. thesis undertaken by me under the guidance of Dr. V. B. Shastry, M.A., M.Ed., Ph.D. Without your sincere cooperation it is impossible to achieve success. So kindly answer the questions as accurately and neatly as possible. Please take time to answer each and every question.

Please answer all the questions without omitting any one. Many of the items require you just to put a tick mark in the appropriate row. Some of the items have two, three or more responses. Kindly tick out the correct one in each case. Kindly give brief information where you have been requested to do so.

Yours Sincerely,

Bhaskar Chandra Mohapatra
Lecturer in Education,
Bhadrak College, Bhadrak.
GENERAL INFORMATION ABOUT THE SCHOOL

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) of your school.
   i) VIII to X - 
   ii) VI to X - 
   iii) IV to X - 
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 - 
   (c) No. of trained intermediate teachers - 
   (d) No. of trained matriculate teachers - 
   (e) No. of untrained 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 - 
   (d) I.A. / I.Sc. with Mathematics as a subject -
(a) How many of them have not studied mathematics at least up to the B.A./B.Sc. level -

(b) At least up to the I.A./I.Sc. level -

10. How many of the Mathematics teachers of the Secondary Classes did not specialise in Mathematics teaching at the
   (i) B.Ed. stage -
   (ii) C.T. stage -

11. Total No. of mathematics teachers of your School teaching mathematics in Class VIII, IX & X -

12. Total No. of students studying mathematics in the classes VIII, IX & X -

13. Proportion of teachers to students -

14. Age and experience of the mathematics teachers -

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Age</th>
<th>Experience</th>
<th>No. of refresher courses, seminars attended.</th>
<th>No. of books articles written in Math.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>
15. Please fill in the following table -  
(Compulsory Mathematics)

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage of students failed in Math. at the H.S.C. Exam.</th>
<th>Percentage of students securing 30 - 44 in H.S.C. Exam.</th>
<th>Percentage of students securing 45 to 74 in H.S.C. Exam.</th>
<th>Percentage of students securing more than 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
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<td>1984</td>
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<tr>
<td>1983</td>
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</tbody>
</table>

16. How many students of your school have qualified in the National Talent Search Examination with mathematics as a subject? -

(B) OBJECTIVES OF TEACHING MATHEMATICS

Put a tick (✓) mark against the right response.

1. Are the objectives of writing the books in Mathematics stated in the preface?
   (a) Yes (b) No (c) To some extent

2. Does the treatment of the subject in the book help the achievement of the objectives stated in the preface?
   (a) Yes (b) To some extent (c) No
3. Are the objectives specified in the syllabus achieved in the treatment of the subject in the book?

   (a) Yes  (b) To some extent  (c) No

4. Does the development of topics in the book help in achieving the objectives of teaching Mathematics?

   (a) Yes  (b) To some extent  (c) No

5. According to you what should be the objectives of teaching mathematics? A list of objectives is given below. You are requested to read the objectives carefully. If you desire to add or cancel one or more objectives, please do it first. Then number them as 1,2,3 ............ according to the order of your preference (No. 1 should be the objective you like the most, No. 2, the next important one and so on).

   - (a) To acquire knowledge of fundamental operations and apply them in new situations.
   - (b) To improve speed, accuracy, neatness and precision.
   - (c) To enable the child to be familiar with mathematics terms, concepts, symbols, formulae, ideas, relationships, procedures, principles, facts and developments etc.
   - (d) To learn the techniques of problem solving.
   - (e) To develop work habits.
   - (f) To apply the knowledge of mathematics in practical life.
   - (g) To develop skill to use mathematical instruments, prepare models, charts, draw figures and read graphs etc.
   - (h) To develop mathematical skills, understanding and attitudes necessary to solve problems of life.
   - (i) To develop the power of generalisation from concrete data.
- (j) To develop the power of logical and critical thinking, objective reasoning and spirit of inquiry.

- (k) To develop the power of original thinking concentration and inductive judgement.

- (l) To develop skill in collecting information from original sources.

- (m) To enable pupils to understand, express and interpret symbolic representation precisely, exactly and systematically.

- (n) To develop the sense of proportion with time factor.

- (o) To develop the ability to understand and appreciate inter-relationship of different branches of mathematics.

- (p)

- (q)

- (r)

(C) GENERAL INFORMATION ON THE MATHEMATICS BOOKS

1. Do you appreciate the get-up of the books ?
   Yes / No

2. Do you appreciate the paper used in the over pages of books ?
   Yes / No

3. Is the quality of papers used in the books good ?
   Yes / No

4. Is the quality of printing good ?
   Yes / No

5. Are the type of letters in the books attractive ?
   Yes / No

6. Have you come across any printing error ?
   Yes / No
7. Is the binding of the books perfect?  
   Yes / No

8. Do you think that the cost of the books is -  
   (a) Low  (b) moderate  (c) High

9. Please mention the errors giving the name of the book, class, page number in the following table:

<table>
<thead>
<tr>
<th>Class</th>
<th>Name of the book</th>
<th>Page No.</th>
<th>Column</th>
<th>Error</th>
</tr>
</thead>
</table>

10. Is the language used within the level of comprehension of an average student?  
    (a) Yes  (b) Yes, barring a few  (c) No

11. Is the mathematics vocabulary used in Oriya translated from English correct?  
    Yes / No

(D) STYLE OF WRITING

1. What are the methods used in explaining the concepts?  (Check one or more).
   (a) Discussion - Posing a question and answering it.
   (b) Description - Direct narration.
(c) Solved examples - By giving practical examples.

(d) Any other (Please mention).

2. Are new terms in each topic explained in clear and definite manner? Yes / No

3. Are the principles involved in a topic discussed in manipulative forms? Yes / No

4. Are the pictorial and graphic illustrations adequate?
   (a) More than adequate
   (b) Adequate
   (c) Inadequate.

5. How do the pictorial and graphic illustrations contribute to the understanding of the subject? Write in brief.

6. Please tick the following those are indicated in the mathematics text books.
   (a) Description in narrative form
   (b) Description in question answer form.
   (c) Illustrative solved examples.
   (d) Exercises for revision.
   (e) Practical exercises.
   (f) Answer to the sums in the exercises.
7. Do the books contain solved examples? 
   Yes / No
8. If yes, do these clarify concepts? 
   Yes / No
9. Can a bright student study the subject on his own? 
   Yes / No
10. Do the sums in the exercises provide scope for individual differences in abilities.
    (a) Yes (b) some extent (c) No
11. If the books contain exercises for revision at what place are the exercises given? (Give tick mark)
    (a) At the end of each topic.
    (b) After all the topics are covered.
    (c) Any other place (Please mention).
12. Do the books contain problems from day to day real life situations? (Tick the appropriate one).
    (a) Yes, quite a number of them
    (b) Yes, a few
    (c) No
13. Have you found any absurdity regarding problems? If yes, please mention. 
    Yes / No
14. Have you found any absurdity in any problem? If yes, please mention. 
    Yes / No
15. Are you satisfied with the sequence of topics in the books? Yes / No

16. If no, please suggest the sequence of topics in the books for all classes.

(A) Algebra and its application:

<table>
<thead>
<tr>
<th>Class</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIII</td>
<td></td>
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<tr>
<td>IX</td>
<td></td>
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<tr>
<td>X</td>
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</tbody>
</table>

(B) Geometry and its application:

<table>
<thead>
<tr>
<th>Class</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIII</td>
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<tr>
<td>IX</td>
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<td>X</td>
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</tbody>
</table>

17. Are the subject topics (within a topic) developed in a sequential order?

(a) Algebra and its application Yes / No
(b) Geometry and its application Yes / No

18. Are the sums in the exercises graded from simple to complex? Yes / No
19. Are there any unnecessary lengthy calculations required for solving the **sums**.

   (Tick the appropriate one)

   (a) For many problems

   (b) For a few problems

   (c) No

20. Listed below are the different topics of compulsory mathematics taught in different classes. Some of the topics may be important, some are less important, some may not be important at all. Give your own opinion for each topic with tick mark in the appropriate column.

<table>
<thead>
<tr>
<th>Class</th>
<th>Different branches and topics</th>
<th>Very important</th>
<th>Important</th>
<th>Moderately important</th>
<th>Unimportant</th>
<th>Should not be included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>7</td>
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</tbody>
</table>

VIII ALGEBRA AND ITS APPLICATION

Set and its elements

Set of Natural numbers

Set of integers

Set of Rational numbers

Set of Real Numbers

Arithmetic & Algebra
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td><strong>Brackets</strong></td>
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<tr>
<td>The four simple rules.</td>
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<tr>
<td>Formulae and their application</td>
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<tr>
<td>Simple factorization and identity.</td>
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<tr>
<td>Coordinate of points &amp; plotting of areas.</td>
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<tr>
<td>Linear equations and inequations.</td>
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<tr>
<td>Application of Algebra in solving arithmetical problems.</td>
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<tr>
<td><strong>IX</strong></td>
<td>Highest common factor.</td>
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<td>Lowest common multiple.</td>
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<tr>
<td>Fractions</td>
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<tr>
<td>First Degree equation with one unknown.</td>
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<tr>
<td>Problems involving 1st degree equations.</td>
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<tr>
<td>Quadratic equation with one unknown.</td>
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<tr>
<td>Simultaneous equations of first degree with two unknowns.</td>
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<tr>
<td>Problems involving simultaneous equations with two unknowns.</td>
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<td>Laws of indices</td>
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<tr>
<td>Logarithm</td>
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<tr>
<td>Graphs of linear equations.</td>
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<tr>
<td>Collection and presentation of data.</td>
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<tr>
<td>Statistical graphs</td>
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<tr>
<td><strong>X. Factorization</strong></td>
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<tr>
<td>Numbers we use - Rational, irrational, real and imaginary.</td>
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<tr>
<td>Graphs of Statistical data - Tabulation of data. Histogram and frequency polygon.</td>
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</table>
Simultaneous equations involving two to three unknowns.

Inequations and graphical representation of $ax + by + c = 0$

Graphs of equation of the form $y = ax^2 + bx + c$

Second Degree equation

VII GEOMETRY & ITS APPLICATIONS

Plane Geometry and geometry of two dimensions.

Theorems on straight lines

Equality of two angles

Parallel straight lines.

Angles formed by straight lines.
<p>| | | | | | | |</p>
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<td>7</td>
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<thead>
<tr>
<th>Congruency of two triangles.</th>
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<tbody>
<tr>
<td>Area of triangles</td>
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<tr>
<td>Area of rectangles and rhombus.</td>
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<tr>
<td>Trapezium</td>
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<tr>
<td>Area of quadrilaterals</td>
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</table>

**Construction of**

- a/ Equilateral
- b/ Right angled triangles
- c/ Isosceles triangles

**IX**

- Inequalities between sides and angles or triangles
- Distance and perpendicular distance between a point and a straight line.
- Area of some figures formed by straight lines having same base and altitude.
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<th>7</th>
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</thead>
<tbody>
<tr>
<td>Projections and relations connecting the sides of a triangle.</td>
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<td>Rectangular parallelopiped.</td>
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<tr>
<td>Trigonometric Ratios.</td>
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<tr>
<td>Solutions of right angled triangles.</td>
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<tr>
<td>Construction of triangles and quadrilaterals.</td>
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<tr>
<td>X Circle</td>
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<tr>
<td>Theorems on circles.</td>
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<tr>
<td>Concurrent straight lines</td>
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<tr>
<td>Construction from No. 24 - 33.</td>
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<tr>
<td>Circumference and length of an arc.</td>
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<tr>
<td>Area of a circle and sector of a circle.</td>
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</tbody>
</table>
21. Are there suggestions in the books for experimental work?  
   Yes / No

22. How often do you use the text books?  
   Give tick (✓) mark in the appropriate column.

<table>
<thead>
<tr>
<th></th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the class</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>For test: questions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For home work</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
23. Do you think that there should be key concepts written in bold letters at the end of each topic? Yes / No

24. Do the books on mathematics contain answers to the exercises? Yes / No

25. Are all the answers given correct? Yes / No

26. Do the incorrect answers create doubt in the minds of the pupils? Yes / No

27. Do the incorrect answers put the mathematics teachers in doubt by the student? Yes / No

28. Are the number of problems in the exercises sufficient? Yes / No

(E) TEACHING

1. Do you teach compulsory mathematics according to the methods you have learnt in your teacher-training institutions? (Tick the appropriate one)

(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

g)

(h)

3. Out of the following methods which do you like the best in class room teaching?

(a) Lecture method
(b) Analytic method
(c) Synthetic method
(d) Inductive method
(e) Deductive method
(f) If any other method you follow, please mention.

4. Do you teach your students the skill of drawing geometrical figures in the class? Yes / No

5. Do you teach your students the skill of drawing mathematical charts and maps? Yes / No

6. Do you encourage your students to prepare mathematical models? Yes / No

7. Do you perform geometrical constructions in the class? Yes / No

8. Do you allow the participation of students in geometrical experiments? Yes / No

9. Do you read reference books? Yes / No

10. Do you solely depend on the prescribed text-books for class room preparation? Yes / No
11. Do you read mathematical journals?
   (a) Regularly
   (b) Occasionally
   (c) Never

12. Do you encourage students to read mathematical journals?

13. Is your teaching affected by
   (a) Lesser number of periods per week?
   (b) Short period?
   (c) Reduction in the number of working days?

14. During teaching do you emphasise some problems which are generally set in the examinations?

15. During teaching do you look to the understanding of all the students?

16. Do you regularly see the homework?

17. If you do not see the homework, what are your difficulties?
   (Please write in brief)

18. Do you think that the homework should be seen in the Class?

19. Do you have some time outside the school hours for preparation of lesson for the class and see the homework?
When do you give classroom tests?

(a) After completion of the topic
(b) Weekly
(c) Half yearly
(d) Yearly

Do you give importance to the marks secured by students in class examinations?

Yes / No

What type of tests do you ask in written examinations?

(a) Essay type - %
(b) Short answer type - %
(c) Objective type - %

100 %

Do you like to set questions in conformity with the objectives of teaching mathematics at the secondary stage?

Yes / No

Do you set questions similar to the questions set by B.S.E., Orissa?

Yes / No

For what purpose do you make use of the examination results?

(a) For awarding promotion
(b) For remedial promotion
(c) For improving syllabus
(d) For teaching methods
(e) Any other purpose, Please mention.

Yes / No
7. Are you satisfied with the type of examination conducted by the Board of Secondary Education, Orissa? Yes / No

8. Do you give appropriate weightage to different content areas in setting questions? Yes / No

9. Every year a large number of candidates in the H.S.C. Examination fail in Mathematics. Do you think that the defective items in question paper are responsible for such failure? Yes / No

10. If any other reason you have to state please write in brief.

11. Do you think that the problems on mathematics set by B.S.E. are directly taken from the books? Yes / No

12. Do you appreciate these type of questions? Yes / No

(G) FACILITIES

1. Total number of periods for teaching mathematics (compulsory) in a week -

2. State the number of periods per week you desire to have for completion of mathematics course -

3. Do you have a mathematics room in your school? Yes / No

4. Do you have sufficient reference books in mathematics (compulsory) in your library? Yes / No
5. Do you have separate mathematics library? Yes / No

6. Do your students read reference books? Yes / No

7. Should mathematics be not compulsory for all students? Yes / No

8. What is your opinion on present teaching of mathematics in Secondary Schools of Orissa?
   (a) Good
   (b) Average
   (c) Poor

9. What according to you are the merits and demerits of Secondary School mathematics syllabus of Orissa?
   (a) Merits -
   (d) Demerits -

10. For teaching of mathematics mathematical equipments and apparatus are necessary. Does your school have such equipment? Please give your opinion in the following table.

<table>
<thead>
<tr>
<th>Equipments</th>
<th>More than sufficient</th>
<th>Sufficient</th>
<th>Insufficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black board</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Chalk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duster</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graph cloth</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
### 11. For the purchase of mathematical charts, models, equipments, books and reference books etc. Sufficient funds are necessary. Is the financial aid sufficient for your school?

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Geometry box</td>
<td></td>
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<td></td>
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<tr>
<td>Models</td>
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<td></td>
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<tr>
<td>Charts</td>
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<tr>
<td>Film strips</td>
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<td></td>
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<tr>
<td>Portraits of great mathematicians</td>
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<td>Levels</td>
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<td>Stencils</td>
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<td>Wooden solids</td>
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<td>Weights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tap</td>
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</tbody>
</table>

Yes / No

### 12. Please state the nature of aid you get for the purchase of the above materials with a tick mark.

- (a) I get money when I need to purchase aids and books.
- (b) I do not get money according to my desire to purchase the same.
- (c) Headmaster/Headmistress purchase the same according to their desire.
1. Are you satisfied with the present system of valuation of mathematics answer books?  Yes / No

2. If no, do you feel that
   (a) Valuation is rapid and the teachers superficially go through the answer books.
   (b) Some teachers do not read the answer books but award marks erratically.
   (c) Concentration on valuation cannot be maintained for some fixed hours.
   (d) Some teachers award lose marks while others are strict.
   (e) Some non-mathematics teachers sometimes value the papers.
   (f) Valuation differs from centre to centre.

3. If any other reasons, you know, please write -
   (a)
   (b)
   (c)

4. Do you think that step marks should be awarded in valuation?  Yes / No

5. If no, do you think that marks on each problem are to be awarded as a whole on the basis of understanding of the pupils?  Yes / No
(I) MISCELLANEOUS

Do you think that there should be negative marking for incorrect answers?

/ No

Pou satisfied with the mathematics curriculum prescribed by the B.S.E., Orissa?

/ No

Would you prepare the mathematics curriculum of your own?

/ No

If you want to prepare your own curriculum, who should prepare it?

Please give tick mark to the best one of your choice:

(a) Only the mathematics teachers
(b) Only the Headmaster/Headmistress
(c) Headmaster and the mathematics teacher
(d) Headmaster, mathematics teacher and the students' representatives
(e) Headmaster, mathematics teacher, students' representatives and the parents

If the B.S.E., Orissa is to prepare the mathematics curriculum, the Board of Studies (Committee for syllabus) has 10 members, what should be the representation of members from different categories from the list given below?

<table>
<thead>
<tr>
<th>Categories</th>
<th>Number of Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>a/ University teachers (Professors, Readers &amp; Lecturers)</td>
<td></td>
</tr>
<tr>
<td>b/ Secondary School Mathematics Teachers</td>
<td></td>
</tr>
<tr>
<td>c/ Training College Mathematics Specialists</td>
<td></td>
</tr>
<tr>
<td>d/ Primary School mathematics teachers</td>
<td></td>
</tr>
<tr>
<td>e/ School student representatives</td>
<td></td>
</tr>
<tr>
<td>f/ Guardians</td>
<td></td>
</tr>
<tr>
<td>g/ Any other categories, please mention</td>
<td></td>
</tr>
</tbody>
</table>

Tota