PAPER-VI & VII (Group B) Opt. (i): TEACHING OF MATHEMATICS

Time: 3 Hours **Max. Marks: 80**
(Internal Marks: 20)

NOTE FOR PAPER SETTERS:
i) Paper setters will set 9 questions in all, out of which students will be required to attempt 5 questions.
ii) Q. No. 1 will be compulsory and carries 16 marks. It will be comprised of 4 short-answer type notes of 4 marks each to be selected from the entire syllabus.
iii) Two long-answer type questions will be set from each of the four units, out of which the students will be required to attempt one question from each unit. Long-answer type questions will carry 16 marks each.
iv) All questions will carry equal marks.

OBJECTIVES:
Pupil-teachers would be able to-

(i) Define Meaning, Nature, aims and objectives of Mathematics
(ii) Explain the relationship of Mathematics with other subjects.
(iii) Explain Historical development and contribution of Indian Mathematics.
(iv) Familiarize the pupil-teachers with the development of Curriculum in Mathematics.
(v) Differentiate between Methods and Techniques of Teaching Mathematics.
(vi) Perform Pedagogical Analysis of various Concepts in Mathematics.
(vii) Describe instructional planning and development of relevant material for the teaching of Mathematics.
(viii) Demonstrate uses of I.C.T. in Teaching of Mathematics.
(ix) Describe Continuous and Comprehensive evaluation, diagnostic testing and remedial teaching in Mathematics.
(x) Explain importance and uses of learning resources in Mathematics.

COURSE CONTENTS

UNIT-I

1) Concept and aims of Mathematics
   - Meaning, Nature and Historical Development of Mathematics.
   - Assumption, postulates, axiom of Mathematics, and Fundamentals of logic namely: use of if and then, and If and only If.
   - Values to be taught through teaching of Mathematics.
   - Aims and Objectives of Teaching Mathematics at Secondary stage.
   - Writing objectives in terms of behavioural outcomes of students.

2) Diagnostic Testing and Remedial Teaching for:
   - Gifted Learners
   - Slow Learners

- Learners with Dyscalculia
- Difficulties Faced by the Teacher in Teaching of Mathematics and Suggestive Measures to overcome them.

UNIT-II

3) Methods of Teaching Mathematics
    - Lecture-cum-Demonstration
    - Inductive-Deductive
    - Analytic-Synthetic
    - Problem Solving
    - Laboratory
    - Project
4) Techniques of teaching Mathematics
    - Oral work
    - Written Work
    - Drill-work
    - Brain-storming
    - Home Assignment
    - Self-study
    - Supervised Study

UNIT-III

5) Learning Resource
    - Importance and Organization of Mathematics Club
    - Recreational Activities of Mathematics Club:
        - Mathematics Fairs
        - Games
        - Quiz
        - Puzzles
        - Visits
        - Talks
    - Importance and Setting up of Math Laboratories.
6) Pedagogical Analysis of the following-
    - Control tendencies Mean, Medium, Mode.
    - Congruency
    - Trigonometry
    - Area
    - Volume
    - Linear and Quadratic Equations
    - Ratio and Proportion.

7) Identification of concepts.

- Listing behavioral Outcomes.
- Listing Activities and experiences
- Listing Evaluation Techniques.

UNIT-IV

8) Instructional Planning & Material Development.
    - Preparation of Micro Lesson Plan
    - Preparation of Simulated Lesson Plan.
    - Preparation of Classroom Lesson Plan.
    - Preparation and use of Audio-Visual Material and equipments.
    - Professional Growth of Mathematics Teacher
    - Application of I.C.T in Teaching of Mathematics.

9) Evaluation.
    - Comprehensive and continuous Evaluation
    - Development of Test Items:
    - Diagnostic Testing and Remedial Technique
    - Preparation of an Achievement Test.
    - Criterion and Norm Reference Test.

Practical/Sessional **Max. Marks: 20**

- pedagogical analysis/Assignments/Internal Exam

SUGGESTED READINGS

Butler, C. H. & Wren, K. H. (1980). The teaching of Secondary Mathematics, New York: McGraw-Hill Book Comp.

Carey L.M. (1975). Measuring and Evaluating School Learning, Boston: Allyn and Bacon.

Copeland, R.W. (1979). How Children Learn Mathematics, New York: McMillan Pub. Comp.

Dave, R. H. & Saxena, R. C. (1970). Curriculum and Teaching of Maths in Secondary Schools, A Research Monograph. Delhi: NCERT

David Wood (1988). How Children Think and Learn, Oxford U.K.: Blackwell Publishers Ltd.
Davis D.R. (1951). The Teaching of Mathematics, London: Addison Wesclyh Press.

Intel (2003). Intel innovation in Education, Intel Tech to the Future- Students Work Book

J.N. Kapur (1991). Suggested Experiments in School Mathematics, New Delhi: Arya Book Depot

Jain, S. L. (1973). Ganit Shikshan, Jaipur: Hindi Granth Academy

Joanna O. Masingila & Frank K. Lester (1988). Mathematics via Problem Solving (Student Resource), New York: Printice Hall Inc.

Kapoor, J. N. (1988). Vidyalaya Ganik ke Liye San Prayog, New Delhi: Arya Book Depot

Kulshrestha, A. K. (2007). Teaching of Mathematics. Meerut: R. Lall Book Depot

Mangal, S. K. (2007). Teaching of Mathematics, New Delhi: Arya Book Depot

Shankaran & Gupta, H. N. (1984). Content-cum-Methodology of Teaching Mathematics, New Delhi: NCERT

Thomas A. S. (1993). Mathematics for Elementary Teachers (An Interactive Approach), Florida: HBJ Publishers