MES's Pillai College of Education and Research(Autonomous), Chembur
Pedagogy of School Subject - Science
Unit Wise Question Bank

Unit 1: Basics of Academic Disciplines
a) Meaning of academic disciplines, Relationship between academic disciplines and Science subject.
b) Classification of academic disciplines: Becher -Biglan typology (pure-hard, pure soft, applied-hard, applied-soft types) with emphasis on the nature of knowledge in each type.
c) Place of Science subject in the present school curriculum

Long Answer Questions

1	Explain the meaning of academic disciplines and the relationship between academic discipline and Science
2	Explain the relationship between academic disciplines and Science
3	Explain how Science can be be related with other Academic Disciplines
4	Elucidate the concept of academic discipline and relationship between academic disciplines and Science.
5	Elaborate the four categories pure-hard, pure-soft, applied-hard, and applied-soft with relevant examples.
6	Illustrate the Academic Disciplines as per Becher-Biglan's typology.
7	"A Science teacher integrates concepts from Mathematics, Geography, and Environmental Studies while teaching climate change." Explain this with reference to the relationship between academic disciplines and Science.
8	"Science is both an independent discipline and an interdisciplinary field of study." Justify this statement with suitable examples.
9	"Science should be a compulsory subject at the school level." Justify this statement with reference to the place of Science in the present curriculum.
10	"A teacher connects Science lessons with issues such as health, sustainability, technology, and environmental conservation." Explain this with reference to the place of Science in the present school curriculum.

Short Answer Questions	
1	Meaning of academic disciplines.
2	Any five Characteristics of Pure-hard disciplines with examples.
3	Any five Characteristics of pure-soft disciplines with examples.
4	Any fiveCharacteristics of applied-hard disciplines.
5	Any five Characteristics of applied-soft disciplines.
6	Relationship of Science with any two academic disciplines
7	Relationship of Science with Fine Arts
8	Relationship of Science with Agriculture
9	Place of Science in the present school curriculum.
10	Importance of Science in the present school curriculum. (Any five points)

Unit 2: Place of Science in the Curriculum and Life **a) Meaning and Nature (Product & Process) of Science , Science Process skills - Basic and Integrated** **b) Aims and Objectives of teaching science at upper primary, secondary and higher secondary level (NCF 2005)** **c) Values of teaching science in socio-cultural context**	
Long Answer Questions	
1	Explain the meaning and nature of science.
2	Explain the nature of Science and Science Process Skills.
3	"Science should be taught as a process of inquiry rather than as a collection of facts." Justify this statement with reference to the nature of Science and Science Process Skills.
4	Elucidate the objectives of teaching Science at Upper primary Level.
5	Elucidate the objectives of teaching Science at Secondary Level.
6	Elucidate the objectives of teaching Science at Higher Secondary Level.

7	“A Science teacher focuses on developing analytical and investigative abilities among students” Explain this with the reference to the objectives of Science teaching at higher secondary level.
8	“Values of teaching science are essential for Indian socio-cultural context.” Explain the statement with examples.
9	"Science education plays a vital role in developing scientific temper and responsible citizenship." Justify this statement with reference to the values of teaching Science.
10	Elaborate on any five values of teaching Science.
Short Answer Questions	
1	Meaning of Science
2	Nature of Science
3	Science Process Skills with two examples
4	Any two objectives of teaching science in upper primary level.
5	Any two objectives of teaching science in Secondary school.
6	Any two objectives of teaching science in Higher Secondary school.
7	Any two values of teaching Science
8	Utilitarian value of teaching Science
9	Social value of teaching Science
10	Cultural value of teaching Science

Unit 3: Organisation of Science Curriculum **a) Maxims of teaching science (Known to Unknown, Whole to Parts, Simple to Complex, Particular to General, Empirical to Rational, Concrete to Abstract)** **b) Co-relation of Science in the Curriculum: Internal & External** **c) i. Infusing Global Perspective in Science Curriculum (Need and Importance), ii. Curriculum Organization- Concentric and Topical approach**	
Long Answer Questions	
1	Explain any five maxims of teaching science
2	“A Science teacher plans lessons based on the maxims Known to Unknown, Simple to Complex, and Concrete to Abstract. Explain how these maxims contribute to effective Science teaching.
3	“Teaching integrated units increases retention and student engagement.” Explain with reference to external correlation of science in curriculum.
4	Illustrate external and internal correlation of Science with any two school subjects
5	Explain the need and importance of Infusing Global Perspective in Science Curriculum
6	“Education prepares students to live in the world of increasing interdependence.” Justify the statement with reference to the need and importance of infusing global perspective in Science Curriculum.
7	Explain the concentric and topical approaches to curriculum organization with suitable examples.
8	Explain the difference between concentric and topical approaches to curriculum organization.
9	"Developing scientific concepts at different stages of schooling promotes meaningful learning." Justify this statement with reference to the concentric approach.
10	Elucidate advantages of topical approach of curriculum organization.
Short Answer Questions	
1	Maxim of teaching Science - From Known to Unknown (Any five points)
2	Maxim of teaching Science - From Whole to Parts (Any five points)
3	Maxim of teaching Science - From Simple to Complex (Any five points)

4	Maxim of teaching Science - From Particular to General (Any five points)
5	Maxim of teaching Science - From Concrete to Abstract (Any five points)
6	Importance of Infusing Global Perspective in Science Curriculum (Any five points)
7	Need of Infusing Global Perspective in Science Curriculum (Any five points)
8	Concentric approach of curriculum construction (Any five points)
9	Topical approach of curriculum construction (Any five points)
10	Difference between topical and concentric approach of organizing science curriculum. (Five points each)

Unit 4: Science Teaching: Methods, Approaches and Tools **a) Methods of Teaching - Lecture cum demonstration method, Project method, Problem Solving** **b) Approach : Inducto-deductive Approach** **c) Concept Mapping – Meaning, Steps and Significance, PEOR (i.e. Predict, Explain, Observe & React)**	
Long Answer Questions	
1	Explain any two methods of teaching Science.
2	Elaborate the process and merits of Lecture cum demonstration Method in the teaching of science.
3	Illustrate the steps of Project method in teaching of Science subject.
4	Illustrate the steps of Problem Solving t method in teaching of Science subject.
5	"Science is best learned through problem-solving." Justify this statement with suitable examples from classroom teaching.
6	"Lecture cum demonstration method is a practical and feasible method of teaching science in an Indian context." Elaborate with reference to its steps and advantages.
7	Elucidate Inducto-deductive Approach with suitable examples
8	Explain the meaning and steps of Concept Mapping

9	"Concept maps help students organize and integrate scientific knowledge." Justify this statement with suitable classroom examples.
10	Explain the significance of PEOR (Predict, Explain, Observe, React) strategy in Science teaching.
Short Answer Questions	
1	Advantages of Lecture-cum-Demonstration Method. (Any five points)
2	Steps involved in the Problem-Solving Method.
3	Advantages of Project method. (Any five points)
4	Any five advantages of the Inducto-Deductive Approach.
5	Importance of Inductive-Deductive approach. (Any five points)
6	Significance of Concept Mapping. (Any five points)
7	Components of PEOR
8	Significance of PEOR. (Any five points)
9	Steps involved in the PEOR strategy.
10	Any five advantages of the PEOR strategy.

Unit 5: Learning Resources and Activity **a) Science Text book: Characteristics of good Science textbook** **b) Science Club and Science Field Visit – Concept, Organisation and Significance** **c) Improvised Apparatus and E- resources (Virtual lab and Simulation)**	
Long Answer Questions	
1	Explain the characteristics of a good Science textbook.
2	“A good science textbook engages the students and helps to achieve the learning outcomes.” Justify with respect to the characteristics of a good Science textbook.
3	Explain the organization and significance of a Science club.

4	"Science learning should extend beyond the classroom." Justify this statement with reference to the significance of Science Clubs and Science Field Visits.
5	Explain the concept and organisation of field visit.
6	"Organisation of field visit imparts meaningful learning experiences in Science teaching."Explain with reference to steps and advantages of organizing field visits.
7	“Field visits are an essential part of teaching science.” Justify this statement with reference to the concept and significance of field visits in enhancing science teaching.
8	Explain the meaning and uses of Improvised Apparatus
9	Explain the meaning and uses of E- resources.
10	Explain the concept of virtual laboratories and simulations. Discuss their advantages and limitations.
Short Answer Questions	
1	Characteristics of good Science textbook (Any five points)
2	Significance of Science Club (Any five points)
3	Significance of Field Visit (Any five points)
4	Steps of organistaion of Field Visit
5	Concept of Improvised apparatus (Any five points)
6	Significance of Improvised Apparatus (Any five points)
7	Characteristics of Improvised Apparatus
8	Uses of E- resources (Any five points)
9	Uses of Simulation (Any five points)
10	Significance of Virtual lab (Any five points)

Unit 6: Science Teacher **a) Science teacher – Need and Avenues of Professional growth** **b) Science Laboratory - Planning and Maintenance, Laboratory Method** **c) Diagnostic testing and Remedial teaching in Science**	
Long Answer Questions	
1	Explain the various avenues of professional growth available to a Science teacher.
2	“Science teachers regularly attend workshops, webinars, and training programmes on innovative teaching methods and educational technology. Explain this with reference to the need and avenues of professional growth.
3	"Continuous professional growth bridges the gap between educational theory and classroom practice." Justify this statement with reference need of professional growth of a Science teacher
4	Explain the need for professional growth among Science teachers.
5	Explain the planning and maintenance of Science Laboratory
6	"Science is best learned by doing." Justify this statement with reference to the Laboratory Method.
7	Explain the meaning, purpose, and procedure of diagnostic testing in Science.
8	“A teacher provides targeted instructional support to a group of students”. Justify this with reference to remedial teaching.
9	Elucidate the stages of preparation of diagnostic test.
10	Elaborate the significance of diagnostic teaching and remedial teaching in Science.
Short Answer Questions	
1	Need for professional growth of a science teacher. (Any five points)
2	Any five avenues of professional growth available to a Science teacher.
3	Importance of Seminars and workshops in the professional development of Science teachers.
4	Importance of participating in conferences for Science teachers. (Any five points)
5	Maintenance of Science Laboratory.

6	Planning a Science laboratory
7	Steps involved in diagnostic testing.
8	Importance of Diagnostic testing (Any five points)
9	Strategies of remedial teaching in science
10	Differentiate between diagnostic testing and remedial teaching. (Five points each)