Part – I (Knowledge of subject concerned : secondary level)

1. **Taxonomy :**
   - Classification of Living organism, five kingdom system.
   - Salient features and classification of plants (major groups upto class). Life cycle of Algae, Fungi, Bryophytes, Pteridophyta, Gymnosperm and Angiosperm.

2. **Structural organization in Animals and Plants :**
   - Animal Tissue : Types, Origin, Location, Structure and functions.
   - Plant tissue : Anatomy of root, stem, and leaves of monocots and dicots
   - Morphology, anatomy and functions of Morphological types Inflorescence, flower and fruits.

3. **Cell Structure and Functions :**
   - Concept of Cell Theory; Structure of Prokaryotic and Eukaryotic cell; Plant and Animal cell; Structure, properties and functions of cell surface - cell process, cell organelles-structure and function; Chromosomes – Structure, types, aberrations.
   - Chemical constituents of living cells : Biomolecules - Structure and functions of proteins, carbohydrates, lipids, nucleic acids;
   - Enzymes – Types, properties and enzyme action.
   - Cell cycle; cell division - mitosis, meiosis and their significance.

4. **Animal Physiology :**
   - Digestion and absorption,
   - Breathing and Respiration,
   - Body fluids and circulation,
   - Excretory product and their elimination,
   - Locomotion and movement,
   - Neural control and coordination,
   - Chemical coordination and regulation,
Reproduction.

5. **Reproduction in Plants**:
Vegetative, Asexual and Sexual Reproduction. Structure of flower, Pollination, Fertilization, Development of embryo.

6. **Genetics and Evolution**:
Mendelion Inheritance: chromosome Theory of Inheritance
Sex determination in human beings.
Linkage and crossing over.

7. **Biology and Human Welfare**:
Basic concepts of immunology, vaccines, Pathogens, Parasites, Cancer, AIDS

8. **Ecology and Environment**:
Organism and its environment. Population and ecological adaptations
Environmental factors (climatic, edaphic and biotic)
Ecosystems- components, types, energy flow; Food chain, food web.

**Part – II (Knowledge of subject concerned : Graduation Level)**

1. **Taxonomy**:
Salient features and classification of non chordata and chordata upto order level with examples.
Symmetry, coelom, metamerism, arthropodization.

Floral variations in Ranunculaceae, Apiaceae, Asteraceae and Poaceae.

2. **Biology and Human welfare**:
Economic importance of protozoa, Helminthes, molluscs and insects.
Plant utilization- cereals (wheat, Rice),
Fiber yielding plants (cotton, Jute),
Vegetable oils (Groundnut, Mustard),
Spices (Coriandor, Fenugreek and cumin),
Medicinal Plants (Commiphora, witharnia),
Beverages (Tea, Coffee)

3. **Biotechnology and its Applications**:
Definition, scope and application; Recombinants DNA technology;
Transgenic animals and plants
Application in Health and Agriculture
Tissue culture-methods and application

4. **Environmental biology** :
Plant and animal succession.
Biogeochemical cycles: Carbon, Nitrogen, Phosphorus.
Environmental Pollution, Air, Water and Noise and Soil Pollution.

5. **Structure (External Internal), Reproduction and life cycle of the following**
Amoeba, Obelia, Taenia, Ascaris, Pheretima, Periplanata, Rana, Rabbit.

6. **Embryology** :
Gametogenesis, Spermatogenesis and Oogenesis, Fertilization, Cleavage, Blastula, Gastrula-Morphogenetic movement, Fate maps, embryonic induction, Metamorphosis of frog. Regeneration, Amphibian limb regeneration.
Extra-embryonic membranes in chick, placenta in mammals.
Endocrine control of ovulation, pregnancy, parturition and lactation.

7. **Plant physiology** :-
Water relations, Transpiration, Photosynthesis, Respiration, Growth, Mineral Nutrition, Plant movements, Nitrogen and Lipid Metabolism.

8. **Biostatistics** : Mean, Mode, Median, Standard deviation, Tabular and graphical representation of data-table, histogram, Pie diagram, bar diagram, line graph.

**Part – III (Knowledge of subject concerned : Post graduation level)**

1. **Technique in Biology** :
Electrophoresis, Centrifugation, Chromatography, Colorimetry, Spectrophotometry, ELISA.


3. **Ethology** :
A brief account of types of behavioral of animals - Feeding, Learning, Instinctive, Motivated, Social and Reproductive.

Part IV (Educational Psychology, Pedagogy, Teaching Learning Material, Use of computers and Information Technology in Teaching Learning)

1. Importance of Psychology in Teaching-Learning:
   - Learner,
   - Teacher,
   - Teaching-learning process,
   - School effectiveness.

2. Development of Learner:
   - Cognitive, Physical, Social, Emotional and Moral development patterns and characteristics among adolescent learner.

3. Teaching – Learning:
   - Concept, Behavioural, Cognitive and constructivist principles of learning and its implication for senior secondary students.
   - Learning characteristics of adolescent and its implication for teaching.

4. Managing Adolescent Learner:
   - Concept of mental health and adjustment problems.
   - Emotional Intelligence and its implication for mental health of adolescent.
   - Use of guidance techniques for nurturing mental health of adolescent.

5. Instructional Strategies for Adolescent Learner:
   - Communication skills and its use.
   - Preparation and use of teaching-learning material during teaching.
   - Different teaching approaches:
     Teaching models- Advance organizer, Scientific enquiry, Information, processing, cooperative learning.
   - Constructivist principles based Teaching.

6. ICT Pedagogy Integration:
   - Concept of ICT.
   - Concept of hardware and software.
   - System approach to instruction.
   - Computer assisted learning.
   - Computer aided instruction.
   - Factors facilitating ICT pedagogy integration.

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## Scheme of Examination

### Subject Concerned

<table>
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<th>S. No.</th>
<th>Subject</th>
<th>No. of Questions</th>
<th>Total Marks</th>
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<td>1</td>
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<tr>
<td>2</td>
<td>Knowledge of Subject Concerned : Graduation Level</td>
<td>55</td>
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<tr>
<td>3</td>
<td>Knowledge of Subject Concerned : Post Graduation Level</td>
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<tr>
<td>4</td>
<td>Educational Psychology, Pedagogy, Teaching Learning Material, Use of Computers and Information Technology in Teaching Learning</td>
<td>30</td>
<td>60</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>300</strong></td>
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</table>

**Note:**
1. All the question in the Paper shall be Multiple Choice Type Question.
2. Negative marking shall be applicable in the evaluation of answers. For every wrong answer one-third of the marks prescribed for that particular question shall be deducted.
   
   Explanation: Wrong answer shall mean an incorrect answer or multiple answer.
3. Duration of the paper shall be 3 Hours.

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