

**GENERAL ENGLISH (FULL MARKS : 100)**

- (a) Essay Writing ..... 20 Marks  
(Not more than 300 words)
- (b) Idioms & Phrases ..... 16 Marks  
(Objective Type/MCQ)
- (c) Comprehension of given passages ..... 12 Marks  
(Objective Type/MCQ)
- (d) Grammar:  
Parts of Speech : Nouns, Adjective, Verb, Adverb, Preposition, etc. .... 20 Marks  
(Objective Type/MCQ)
- (e) Composition (Objective Type/MCQ) ..... 16 Marks  
(i) Analysis of complex and compound sentences.  
(ii) Transformation of sentences.  
(iii) Synthesis of sentences.
- (f) Correct usage and vocabularies ..... 16 Marks  
(Objective Type/MCQ)

**PAPER – I : BASIC SCIENCES (Objective Type/MCQ) (150 MARKS)****UNIT – I**

- 38 Marks

Economic importance of algae and fungi ; Root stem transition, mechanism of photosynthesis in  $C_3$ ,  $C_4$  and CAM plants, respiration, photorespiration, photoperiodism and vernalisation, gene and genetic code, cell structure and functions mitosis, meiosis, gene interaction, multiple alleles, linkage and crossing over, ecological factors, adaptation, community structure & development, structure & function of ecosystem ; Environmental problems – ozone depletion, global warming and desertification.

Adaptation of snakes, birds and mammals ; Mendelian Laws of inheritance, recombination, linkage, linkage maps and crossing over, multiple alleles, mutation, origin of life, , source and nature of variations, natural selection, population – competition, predation, parasitism, commensalism, cooperation and mutualism ; community ecology and succession, concept of ecosystem, pollution control and management, biodiversity and conservation.

**UNIT – II**

- 38 Marks

First, second and third Laws of Thermodynamics ; order and molecularity of reactions, first & second order of reactions ; polythene, polysterine, nylon and terylene; concept of oxidation and reduction, oxidation number, application of redox reactions; carbohydrates, proteins, vitamins and Nucleic aids; IUPAC nomenclature of mononuclear coordination compounds, isomerism, valance bond Theory (VBT), colour, magnetic properties of coordination compounds; Transition element-metalic character, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation; IUPAC nomenclature of organic compounds; surface chemistry – Adsorption, factors affecting adsorption of gases on solids, colloidal solutions, Tyndall effect, Brownian movement, electrophoresis, emulsion.

**UNIT – III**

- 38 Marks

Mass energy equivalence ; kinetic theory of gasses, black body radiation, specific heat of solids, alternating currents, LCR, circuits, series and parallel resonance circuits, quality factor, radio- activity – half life, mean life, displacement law of radioactive materials, alpha, beta and gama radiation. Concepts of force, Inertia, Newton's Laws of Motions, Electric Current, Ohm's Law, Electrical resistivity and

conductivity, Carbon resistors, colour code for carbon resistors, series and parallel combination of resistors. Electromagnetic waves and their characteristics, Electromagnetic spectrum including elementary facts about their uses.

**UNIT – IV**

- 36 Marks

Permutation and combinations and their simple application, compound, angle-multiple and sub-multiple angles, solution of trigonometric equation, properties of triangles ; concept of limit, continuity, derivation of standard functions, successive differentiation, simple cases, standard method of integration, averages (mean, mode, median), Dispersion (Standard deviation and variance), definition of probability, mutually exclusive events, independent events, linear relationship.

**PAPER – II : (Objective Type/MCQ) (150 MARKS)****APPLIED SCIENCES**

- 130 marks

Soil Condition and Plant Growth : Soil properties – physical, chemical and biological ; Soil factors for plant growth – fertility, productivity, essential plant nutrients, soil moisture, soil temperature & air, organic matter, humus and litter decomposition, acid & alkali soil formation and reclamation, Soil – water – nutrients – plant relationship ; C:N ratio, soil micro-organisms and their role in soil fertility & productivity, biological nitrogen fixation and its role in plant nutrition.

Soil Erosion : Factors, forms and impact on land degradation ; Soil erosion control – mulching, terracing, contouring, cover crops, conservation farming, contouring, diversion channels, gully plugs/check dams, bunding, wind breaks/ shelter belts ; Water Conservation – Rain water harvesting, stream water conservation and utilization, types of forest in India and need for conservation of existing and manmade forests ; Social forestry – definitions, objectives, components, community forest, Agroforestry – definitions, objectives, importance and scope, agroforestry system ; types of agroforestry system, their merits and demerits ; Shifting cultivation – definition, extent and status in Mizoram, biophysical and socio-economic problems of shifting cultivation. Watershed Management – definition, concept and objectives ; its relevance to Soil & Water Conservation and productivity of the watershed.

**APTITUDE TEST**

- 20 Marks

## (a) Numerical And Figurework Tests: (4 Marks)

These tests are reflections of fluency with numbers and calculations. It shows how easily a person can think with numbers. The subject will be given a series of numbers. His/Her task is to see how the numbers go together to form a relationship with each other. He/She has to choose a number which would go next in the series.

## (b) Verbal Analysis And Vocabulary Tests: (6 Marks)

These tests measure the degree of comfort and fluency with the English language. These tests will measure how a person will reason with words. The subject will be given questions with alternative answers, that will reflect his/her command of the rule and use of English language.

## (c) Visual And Spatial/3-D Ability Tests: (4 Marks)

These tests are used to measure perceptual speed and acuity. The subject will be shown pictures where he/she is asked to identify the odd one out; or which comes next in the sequence or explores how easily he/she can see and turn around objects in space.

## (d) Abstract Reasoning Tests: (6 Marks)

This test measures the ability to analyse information and solve problems on a complex, thought based level. It measures a person's ability to quickly identify patterns, logical rules and trends in new data, integrate this information, and apply it to solve problems.