

Code 02 : MAJOR SUBJECT GROUP – PLANT SCIENCES

(Subjects : 2.1: Plant Breeding & Genetics, 2.2: Plant Pathology, 2.3: Agricultural Microbiology / Microbiology, 2.4: Seed Science & Technology, 2.5 : Plant Genetic Resources)

UNIT – I : Importance of Agriculture in national economy; basic principles of crop production; cultivation of rice, wheat, chickpea, pigeon – pea, sugarcane, groundnut, tomato, potato and mango. Major soils of India, role of NPK and their deficiency symptoms.

UNIT – II : Structure and function of cell organelles; mitosis and meiosis; Mendelian genetics; elementary knowledge of photosynthesis; respiration, and transpiration; structure and functions of carbohydrates, proteins, nucleic acids, enzymes and vitamins. Major pests and diseases of rice, wheat, cotton, chickpea, sugarcane and their management.

UNIT – III : Characteristics of prokaryotic and eukaryotic organisms, differences between fungi, bacteria, mycoplasmas and viruses; physical and chemical basis of heredity; chromosome structure; genes / operon concept; protein biosynthesis; transformation, recombination, Heterosis; Elements of economic botany; integrated diseases management; sterilisation, disinfection and pasteurization; Koch's postulates; aetiological agents of rusts, smuts, powdery / downy mildews, wilts, yellows, mosaic, necrosis, enations, blights and witchesbroom; pH, buffer, vitamins, role of plant hormones in seed germination and dormancy; pollination / fertilization in flowering plants; methods of seed testing; breeders, foundation and certified seeds; seed production in self and cross pollinated crops, nitrate assimilation; biological nitrogen fixation and other uses of microorganisms in agriculture.

UNIT – IV : Food and industry; composting and biogas production. Important rural development programs in India; organizational set up of agricultural research, education and extension in India.