DEPARTMENT OF BOTANY, ST. XAVIER'S COLLEGE (Autonomous), Mumbai.
T. Y. B. Sc. Botany Syllabus (2016-2017)

SEMESTER-VI Course: S.BOT.6.01 PLANT PHYSIOLOGY AND BIOCHEMISTRY- III

LEARNING OBJECTIVES

The students will be able to understand-

- The biochemical steps involved in nitrogen assimilation in plants and will be able to differentiate between the process of inorganic and organic nitrogen fixation.
- The phenomenon of transformation of vegetative axis into reproductive axis and the substances responsible for this transformation.
- The process of seed germination and know the factors which facilitate the germination and the physiology of fruit ripening.
- The time measuring mechanism in plants.
- The ageing process in plants.

UNIT I: NITROGEN METABOLISM AND FRUIT RIPENING PROCESS: Assimilation of inorganic nutrients- N_2 cycle. Reduction of nitrate, Assimilation of ammonia, Biological nitrogen fixation, Biochemistry of biological nitrogen fixation, Effects of nitrogen assimilation on carbohydrate utilization. Physiology of fruit ripening.

UNIT II: PLANT GROWTH: Vegetative growth- Definition, Quantitative aspects of growth of annual plants, Factors affecting growth; Reproductive growth- Initiation of flower primordial, Environment and flower initiation (photoperiodism and vernalization), Florigen.

UNIT III: PLANT GROWTH SUBSTANCES: Plant growth substances: biosynthesis, physiological role and practical applications of following: Auxins, Gibberellins, Cytokinins, Ethylene, Abscisic acid- Growth retarding chemicals.

UNIT IV: PHYSIOLOGY OF SEEDS, AGING PROCESSES AND TIME MEASURING MECHANISM: Physiology of seeds- Seed germination, Morphological and biochemical changes accompanying seed germination, Dormancy. Aging and senescence; Biological clock.

Practicals- Course: S.BOT PR.6.01

1. To study the activity of nitrate reductase.
2. To estimate the α-amino nitrogen.
3. To estimate the total protein content by Lowry's method.
4. Separation of amino acids by paper chromatography.
5. Inhibition of seed germination by inhibitors in fruit juices.
6. Mobilization of starch during seed germination by amylases (qualitative)
7. Separation of organic acids by chromatography.

CIA- short answers question / assignment / presentation / problem solving / project / test.

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T. Y. B. Sc. Botany Syllabus (2016-2017)

SEMESTER-VI Course: S.BOT.6.02 ECOLOGY AND ENVIRONMENTAL BOTANY-I

LEARNING OBJECTIVES : The students will be able to understand-

- The role and importance of biotic and abiotic environmental factors in the sustenance of plant life.
- Causes, consequences, prevention, remediation of pollution and efforts taken in reducing or controlling the pollution causing factor.
- The importance of phytogeography and forestry for man and the legal enforcements imposed by government in preventing the loss to the natural regional flora.

UNIT I: ECOLOGICAL FACTORS (ABIOTIC): Light- quality, duration, absorption, intensity, effects on plants; Temperature- variation due to altitude, effects on plants, thermal constant and stratification; Water- Precipitation, moisture, measurement of rainfall. Wind - speed, advantages and damage caused to plants.

UNIT II: ECOLOGICAL FACTORS (SOIL AND BIOTIC FACTORS): Soil- soil profile, texture, classification, moisture, water, organic matter, atmosphere, temperature, organisms. Biotic-community relationships- mutualism, mycorrhizae, commensalisms, protocooperation, competition, amensalism and saprophytes.

Unit III: POLLUTION**:** Air pollution- causes and consequences of polluting gases; ozone depletion, greenhouse effect, global warming, acid rain, smog. Water pollution- causes and consequences of eutrophication, sewage, industrial waste, heavy metals, oil in sea. Soil pollution- Organic and inorganic chemicals in the soil, bioagents and toxins; Phytoremediation. Effect of Air, Water and Soil pollution on vegetation.

UNIT IV: FORESTRY**:** Types of forests**,** destruction of forests, deforestation, aforestation, reforestation; institutions for forest research, education and training; Biosphere reserves. Forest Conservation act, 1980; Indian Forests Act (Revised) 1982; The Indian Wildlife (Protection) Act – 1972 amended 1991.

Practicals- Course: S.BOT PR.6.02

1. Study of ecological instruments i.e. lux meter, rain guage, hygrometer, wet and dry bulb thermometer, wind anemometer, maximum and minimum thermometer, barometer.
2. To study the chemical characters (moisture, carbonate, nitrate, base deficiency, pH) of soil by use of rapid tests.
3. Determination of COD in water sample; Determination of BOD in water sample.
4. Determination of salinity and chlorinity of water sample.
5. Estimation of organic matter and organic carbon from soil.
6. Determination of percent leaf area injury of different infected leaf samples.
7. Estimation of nitrates from soil sample.

CIA- assignment / presentation / field report / open book test.

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