# VEER NARMAD SOUTH GUJARAT UNIVERSITY SURAT.

**F.Y B.Sc.**

BIOLOGY PAPER-I (BOTANY)

(Effective from June 2010-2011)

UNIT : I **Morphology:**

(1) Aestivation: Definition and types with examples.
(2) Placentation: Definition and Types with examples.
(3) Phyllotaxy: Definition and Types with examples.
(4) Inflorescence: Definition and Types: Racemose and Cymose

UNIT : II **Diversities of Plants: Cryptogams:**

Algae : General characters, classification, thallus, cell structure, and reproduction in Spirogyra.

Fungi : General characters, classification, thallus cell structured and reproduction in Mucor.

Bryophyta : General characters, classification, external and internal structure, reproduction, alternation of generation in Funaria. (Except development)

Pteridophyta: General characters, classification, external and internal Structure, reproduction, alternation of generation in Nephrolapis. (Fern) (Except development)

UNIT : III **Diversities of Plants: Phanerogams.**

Gymnosperm: General characters, classification, external and internal Structure, reproduction and alternation of generation in Cycas.
(Except development)

Angiosperms : Classification as per Bentham & Hooker's system of Classification, general characters, economic and medicinal importance, Botanical name of common important plants of the following families.

(1) Malvaceae (2) Convolvulacea (3) Apocynaceae

(4) Solanaceae (5) Nyctaginaceae (6) Amarillidaceae

UNIT : IV **Anatomy :**

(1) Stele : Definition and types.
(2) Vascular Bundles : Definition and types.
(3) Ergastic matters : Starch grain, Aleurone grains,Raphides, Sphaerephides, Cystolith.

UNIT : V **Plant physiology :**

(1) Imbibition.
(2) Photosynthesis-Definition, pigments, Quantasome Light reaction and Dark reaction.
(3) Plant movement:
(I) Movement of locomotion:
A. Autonomous movements: (1) Cilliary (2) Amoeboid.
B. Para tonic movements : (1) photo tactic (2) Chemo tactic (3) Thermo tactic.

(II) Movement of curvature:
A. Growth movements: (1) Phototropism (2) Geotropism (3) Hydrotropism (4) Chemotropism
B. Variation Movements: (1) Seismonastic (2) Nyctianastic (3) Thigmonastic

(4) Plasmolysis :

UNIT :VI : **Ecology :**

(A) Ecological adaptations of Hydrophytes, Mesophytes and Xerophytes with appropriate examples.
(B) General account of biotic factors on vegetation.

UNIT :VII : **Plant Pathology:**

Causal organisms, symptoms and control measures of the following plant diseases.
(1) Citrus canker.
(2) Rust of Wheat. (Puccinia)
(3) Red rot of Sugarcane.
(4) Green ear of Bajara.

UNIT: VIII: **Human affairs :**

(1) Forests: Importance of forests and their conservation.
(2) Agriculture: Definition and importance of Silvicalture and Horticulture.

UNIT : IX : **Medicinal Plants:**

(1) Abrus precatorius
(2) Adhatoda vasica.
(3) Tinospora cordifolia.
(4) Aloe barbadensis.
(5) Vitex negundo

UNIT : X : **Biotechnology :**

Introduction of Biotechnology
Application of Biotechnology
Techniques of Biotechnology
The new green revolution

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BIOLOGY
PRACTICAL-1

The candidates should study the typical vegetation in natural condition and should record their observation in journals. Excursion should be arranged during the year to local places. Every candidate shall complete laboratory course in accordance with the regulations issued from time to time by Academic Council on the recommendation of the Board of Studies. Every candidate shall record observation directly in the laboratory journal. Every journal shall be signed periodically. At the end the year candidate shall produce certified journals at the practical examination.

PRACTICAL: I (BASED ON PAPER I)

## (A)-MORPHOLOGY :

(1) **Aestivation.**

(i) Circular
(a) Valvate: Calyx of Hibiscus
(b) Twisted: Corolla of Hibiscus.

(ii) Spiral
(a) Imbricate: Corolla of Caesalpinia.
(b) Quincuncial : Corolla of Antigonon.
(c) Vexillary : Corolla of Clitoria.

(2) **Placentation.**

Study of Placentation to be demonstrated by permanent slides.
(i) Marginal
(ii) Axil
(iii) Free central
(iv) Parietal
(v) Superficial
(vi) Basal

(3) **Phyllotaxy:**

(i) Distichous phyllotaxy
(ii)Tristichous
(iii) Pentastichous
(iv) Opposite superposed
(v) Opposite decussate

(vi) Verticillate or Whorled
(vii) Leaf mosaic
(viii) Hetrophylly

(4**) Inflorescence:**

**RACEMOSE**

(i) Raceme: Caesalpinia pulcherrima, Brassica juncea
(ii) Spike: Achyranthus aspera, Polianthes tuberose
(iii) Spadix: Colocasia
(iv) Catkin: Acalypha hispida
(v) Spikelets: Poaceae (any plant)
(vi) Corymb: Cssia, Ixora
(vii) Umbel: Coriandrum
(viii) Capitate: Acacia, Albizzia
(ix) Capitulum: Helianthus, Tridax

**CYMOSE**

Unbranched:
(i) Solitary Terminal: Datura
(ii) Solitary Axillary: Hibiscus
(iii) Helicoid: Hamelia
(iv) Scorpioid: Heliotropium
(v) Dichasial or Biparous: Clerodendrum,Nyctanthus, Jasminum
(vi) Polychasial or Multiparous: Nerium, Calotropis

**(B) Cryptogams:**

(1) Spirogyra:
To study the thallus structure and reproduction ( Scalariform and Lateral conjugation).
(Permanent slides of thallus W.M, Scalariform conjugation, Lateral Conjugation.)

(2) Mucor :
To study the thallus structure and reproductive structure. Permanent slides of Mucor vegetative W.M. Mucor sporangia, Mucor Zygospore.

(3) Moss (Funaria).
To study the external features of Funaria.
Permanent slides of Funaria antheridia W,.M.
Funaria archegonia W.M.

(4) Nephrolepis :

Preparation of slides from the fresh material by the students of T.S of Stolon, T,S. of Rachis.
Permanent slides: T.S. of Stolon, T.S. of Rachis, T.S. of leaflet passing through sori, Nephrolepis prothallus, Fern sori W.M., prothallus with antheridia, prothallus with archegonia, prothallus with sporophyte.

**(C) Phanerogams:**

(1) Gymnosperm:
Cycas.
Preparation of slides from the fresh material by the students of T.S. of Rachis, T.S. of Leaflet.
Permanent Slides: T.S. of Leaflet, T.S. of Rachis, T.S. of Coralloid root, T.S. of Microsporophyll, T.S. of Megasporophull, L.S. of Ovule.
Preserve Specimen: Coralloid root, Microsporophyll and Megasporophyll.

(2) Angiosperm: (Families)
Study of Morphological characters of following families.
Floral dissection, T.S of Ovary and floral formulae.
(1) Malvaceae : Hibiscus rosasinensis, Thespesia, Gossypium.
(2) Convolvulaceae: Ipomea palmeta
(3) Apocuynaceae : Nerium, Allamanda, Catharanthus roseus, (Vinca rosea).
(4) Solanaceae : Solanum xanthocarpum or any local available plant.
(5) Nyctaginaceae : Bougainvallea, Mirabilis.
(6) Amaryllidaceae : Crinum, Polianthes.

**(D) Anatomy:**

(I) Stele: Study of stele from permanent slides:
(1) Actinostele.
(2) Plectostele.
(3) Amphiphloic siphonostele.
(4) Eustele.
(5) Atactostele.

(II) Vascular Bundles:
Study of various types of Vascular bundles from Permanent slides.

(1) Radial
(2) Amphicribral (Hadrocentric)
(3) Collateral and open
(4) Collateral and closed

(5) Bicollateral

(III) Non living cell contents:
Slides are to be prepared by the students from given materials.

(i) Starch grains: Pothos tuber, Wheat or Rice , Euphorbia tiruculli.
(ii) Aleurone grains: Castor seed.
(iii) Mineral Crystals:
(1) Raphides: Pothos, Colocasia petiole.
(2) Sphacraphides: Opuntia, Nerium leaf.
(3) Cystolith: Ficus (Banyan)leaf.

**(E) Ecology :**

(1) Hydrophytes:
(a) Fresh specimens to be shown to the students:
Hydrilla, Vallisneria, Chara, Eichhornia, Pistia, Nymphaea, Marsilea.
(2) Mesophytes:
(a) Fresh specimens to be shown to the students:
Coriander, Trigonella, Garlic (Entire plants)
(3) Xerophytes:
(a) Fresh specimens to be shown to the students:
Solanum xanthocarpum, Casuarina, Aloe vera, Opuntia, Euphorbia tiruculli, Acacia, Ziziphus.

**(F) Physiology:**

(Experiment to be demonstrated)
(a) Imbibition and Imbibition force.
1. Test tube experiment.
2. Indicator experiment
(b) Mohl's half leaf experiment
Light is necessary for photosynthesis
(c) Plant movements:
1. Geotropism
2. Phototropism
3. Hydrotropism
(d) Plasmolysis

**(G) Medicinal plants:**

Fresh or preserve specimen for demonstration as per theory.

(H) **Plant Pathology:**

Causal organisms, symptoms and control measures of the following plant diseases.

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