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M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019
Botany
BIOLOGY AND DIVERSITY OF ALGAE, BRYOPHYTES AND
PTERIDOPHYTES

Day & Date: Tuesday, 05-11-2019
 Time: 11:30 AM To 02:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.
 2) Figures to the right indicate full marks.
 3) Draw neat labelled diagrams wherever necessary.

Q.1 Fill in the blanks by choosing correct alternatives given below.

14

- 1) Leaves of _____ plant have legume.
 - a) Pinus
 - b) Cycas
 - c) Selaginella
 - d) Lycopodium
- 2) _____ type of antherozoids are found in Equisetum.
 - a) Biflagellate
 - b) Uniflagellate
 - c) Multiflagellate
 - d) None of these.
- 3) Marsilea is found in _____ habitat.
 - a) Terrestrial
 - b) Aquatic
 - c) Amphibian
 - d) Both B & C
- 4) Siphonostele is found in _____ stem.
 - a) Ephedra
 - b) Marsilea
 - c) Equisetum
 - d) Pinus
- 5) _____ type of reserve food material found in Chlorophyceae.
 - a) Starch
 - b) Fat
 - c) Both A and B
 - d) Laminarin
- 6) _____ is father of modern Algology of India.
 - a) Fritsch
 - b) Iyengar
 - c) Alasingaracharya
 - d) Allen
- 7) Eye spot is absent in _____ class of algae.
 - a) Rhodophyceae
 - b) Phaeophyceae
 - c) Chlorophyceae
 - d) Cyanophyceae
- 8) The gametophyte of Psilotum is _____.
 - a) Endosporic
 - b) Endoscopic
 - c) Exosporic
 - d) Dioecious
- 9) The archegoniophore of Marchantia is known as _____.
 - a) Carpogonium
 - b) Archegonium
 - c) Female receptacle
 - d) Carpocephalum
- 10) In bryophytes vegetative reproduction takes place by _____.
 - a) Gemmae
 - b) Aplanospores
 - c) Haplanospore
 - d) Akinetes

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M.Sc.(Semester - I) (CBCS) Examination Oct/Nov-2019
Botany

TOOLS AND TECHNIQUES IN BOTANY

Day & Date: Saturday, 09-11-2019
Time: 11:30 AM To 02:00 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) All questions carry equal marks.
4) Draw neat labeled diagrams whenever necessary.

Q.1 Fill in the blanks by choosing correct alternatives given below. 14

- 1) A basic principle of AAS may be expressed by the statement _____.
 - a) All atoms emit light
 - b) All atoms produce light
 - c) All atoms absorb light
 - d) All atoms produce light of a specific wavelength
- 2) _____ is the most suitable gas to use as a carrier gas in a gas chromatogram.
 - a) Helium
 - b) Oxygen
 - c) Methane
 - d) Both a and c
- 3) High performance liquid chromatography (HPLC) cannot be used to _____.
 - a) separate types of organic pesticides
 - b) determine the mercury content of a fish sample
 - c) identify the various pigments from a leaf extract
 - d) determine the caffeine content of coffee samples
- 4) Which would be best to separate a protein that binds strongly to its substrate?
 - a) Gel filtration
 - b) Affinity chromatography
 - c) Cation exchange
 - d) Anion exchange
- 5) Isotopes of an element _____.
 - a) may or may not be radioactive
 - b) have the same atomic number but differing atomic masses
 - c) may be used for human disease diagnostics
 - d) all of the above
- 6) The main advantage of fluorescence over UV-Vis spectroscopy is _____.
 - a) Its sensitivity
 - b) Its compatibility with separation techniques
 - c) Its compatibility with most analysts
 - d) None of the above
- 7) Chi square test (X^2) is _____.
 - a) measure the degree of deviation of the experimental result from the expected result
 - b) to test the closeness of observed and expected frequency
 - c) to test the population variance and sample variance
 - d) all of these

- 8) Living, unstained cells and organisms can be observed best using _____.
 a) Fluorescent microscopy b) TEM
 c) Phase contrast microscopy d) Scanning electron microscopy
- 9) Scanning electron microscopy (SEM) is best used to study _____.
 a) small internal cell structures
 b) internal structure of live, motile cells
 c) surface morphology
 d) all of the above
- 10) A Geiger-Muller counter is able to provide an indirect measure of radioactivity because radiation has a property of _____.
 a) ionization b) making matter glow in the dark
 c) fogging photographic film d) attracting electrons
- 11) In _____ distribution probability of success remains constant from trial to trial.
 a) Normal b) Poisson
 c) Binomial d) None of these
- 12) The biggest herbarium in India is _____.
 a) I.A.R.I Delhi
 b) Central National Herbarium, Calcutta
 c) St. Xavier's Herbarium, Bombay
 d) Foreset Research Institute, Dehradun
- 13) _____ chemical is used for poisoning the specimens in herbarium technique.
 a) Hg_2Cl_2 b) $AgNO_3$
 c) HCl d) $HgCl_2$
- 14) Which of the following identifies three types of sources used in AAS?
 a) Hollow cathode Lamp (HCL), Electrode less Discharge Lamp (EDL), Argon lamp
 b) Electrode less Discharge Lamp (EDL), Deuterium (D2) lamp, Hollow Cathode Lamp (HCL)
 c) Deuterium (D2) lamp, plasma, flame
 d) Neon lamp, Acetylene torch, Tungsten lamp

Q.2 A) Answer the following question.(Any Four) 08

- 1) Define buffer and give its examples.
- 2) Define regression.
- 3) Write any two application of ultracentrifugation.
- 4) Write any two application of gel electrophoresis.
- 5) What is half-life of radio isotopes?

B) Write Notes on. (Any Two) 06

- 1) Principle of Flame spectrophotometry
- 2) Effect of radiation on biological system
- 3) Standard units of expression

Q.3 A) Answer the following question. (Any Two) 08

- 1) What is probability? Give its examples.
- 2) Explain application of computer in life science.
- 3) Explain principle of electron microscope.

B) Answer the following question.(Any One) 06

- 1) Write application of HPCL.
- 2) Explain important herbaria in India.

- Q.4 A) Answer the following question. (Any Two) 10**
- 1) Explain the principle and application of gas chromatography.
 - 2) Explain the principle and application of photomicrography.
 - 3) Explain the principle and application of TEM.
- B) Answer the following question. (Any One) 04**
- 1) Explain in brief radioisotopes.
 - 2) Write application of gel filtration.
- Q.5 Answer the following question. (Any Two) 14**
- a) Describe in brief principle and application atomic absorption.
 - b) Describe in brief principle and application of phase contrast microscopy.
 - c) Describe in brief principle and application of SEM.

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M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019
Botany

CELL AND MOLECULAR BIOLOGY OF PLANTS

Day & Date: Friday, 08-11-2019
Time: 11:30 AM To 02:00 PM

Max. Marks: 70

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Multiple Choice Questions.**14**

- 1) Plasma membrane is _____.
a) S.J. Singer
b) G.L. Nicolson
c) Aristotle
d) Both a & b
- 2) _____ is not a histone.
a) H2A
b) H2B
c) H3
d) H6
- 3) _____ are the membrane transport proteins.
a) Uniporter
b) Symporter
c) Antiporter
d) All of these
- 4) Endocytosis is _____ transport.
a) passive
b) active
c) small
d) large
- 5) 30S ribosome occurs in _____ RNA.
a) tRNA
b) rRNA
c) mRNA
d) snRNA
- 6) _____ is an exogenous agent that damage DNA.
a) Oxidation
b) Alkylation
c) Ionizing radiation
d) Hydrolysis
- 7) _____ is not a stop codon.
a) UGA
b) UGG
c) UAA
d) UAG
- 8) Chloroplast DNA is denoted as _____.
a) mtDNA
b) CtDNA
c) nDNA
d) cpDNA
- 9) GISH stands for _____.
a) Gene *in situ* hybridization
b) Genomic *in situ* hybridization
c) Genetic *in situ* hybridization
d) Genomic *in silico* hybridization
- 10) mtDNA is inherited from _____.
a) Father
b) Mother
c) Grandfather
d) Mother in-law
- 11) Satellite DNA is present in _____ region.
a) Coding
b) Non coding
c) Centromere
d) Both b & c

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M.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019
Botany

CYTOGENETICS, PLANT BREEDING AND GENETIC ENGINEERING

Day & Date: Tuesday, 05-11-2019
Time: 03:00 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw a neat, well labeled, complete diagram wherever necessary.
4) Use of calculators, cell phones, or any other electronic gadgets is prohibited.

Q.1 Fill in the blanks by choosing correct alternatives given below.

14

- 1) Integration of viral 'DNA' into cell 'DNA' results in a structure named as
 - a) Viral genome
 - b) Prophage
 - c) Virion
 - d) Prion
- 2) When DNA helix has normal number of base pairs per helical turn then it is _____ state.
 - a) Coiled
 - b) Supercoiled
 - c) Normal
 - d) Elongated
- 3) Heterochromatin is usually localized to periphery of the _____.
 - a) Cell membrane
 - b) Cytoplasm
 - c) Nucleus
 - d) Cell wall
- 4) Part of chromosome that links sister chromatids is called _____.
 - a) Telomere
 - b) Centromere
 - c) Isomer
 - d) Polymer
- 5) Which of the following involves remarkable capacity of short segment of DNA from one place to another?
 - a) DNA transposition
 - b) DNA replication
 - c) Transcription
 - d) Translation
- 6) Which of the following occurs between particular short sequences present on otherwise dissimilar parental molecule?
 - a) Homologous genetic recombination
 - b) Site specific recombination
 - c) Non homologous recombination
 - d) Replicative recombination
- 7) Which of the following contain the sequences required for transposition and the genes for proteins that promotes the process _____.
 - a) Insertion sequences
 - b) Complex transposition
 - c) Transposons
 - d) Chromosomes
- 8) Crossing over in diploid organism is responsible for _____.
 - a) Dominance of genes
 - b) Segregation of alleles
 - c) Recombination of linked genes
 - d) Linkage between genes
- 9) Synthetic seed is produced by encapsulating somatic embryos with _____.
 - a) Sodium chloride
 - b) Sodium alginate
 - c) Sodium acetate
 - d) Sodium nitrate

- 10) Cybrids are _____.
 a) Nuclear hybrids
 b) Hybrids from cross pollination
 c) Cytoplasmic hybrids
 d) Cytological hybrids
- 11) Hybridoma technology was developed by _____.
 a) Kohler and Milstein
 b) Khorana and Nirenberg
 c) Khorana and Kornberg
 d) Beedle and Tatum
- 12) Monoclonal antibodies are produced by _____.
 a) in vivo method
 b) suspended cell culture in fermenters
 c) immobilized cell reactors
 d) All of these
- 13) Which of the following is not a variant of BLAST?
 a) BLASTN
 b) BLASTP
 c) BLASTX
 d) TBLASTNX
- 14) The protein coat of virus is called _____.
 a) Nucleiod
 b) Capsid
 c) Capsomere
 d) Outer envelop

- Q.2 A) Answer the following (Any Four) 08**
 1) Role of Rec A enzyme.
 2) Write in brief about plasmid genome.
 3) What is gene mapping?
 4) What is NCBI?
 5) Recombination nodule.
- B) Write Notes on (Any Two) 06**
 1) Significance of mobile genetic element.
 2) Explain molecular mechanism of recombination.
 3) Explain architectural difference of the genome.
- Q.3 A) Answer the following (Any Two) 08**
 1) Write a note on independent assortment.
 2) Bioinformatic resources on internet.
 3) Explain conventional method of construction of restriction map.
- B) Answer the following (Any One) 06**
 1) Describe genome structure of yeast.
 2) Describe hybridoma technology.
- Q.4 A) Answer the following (Any Two) 10**
 1) Explain gene conversion.
 2) Describe linkage group.
 3) Explain BLAST.
- B) Answer the following (Any One) 04**
 1) What are risks and ethical issues of IPR?
 2) Explain protein data bank.
- Q.5 Answer the following (Any two) 14**
 a) Explain size and structure of genome of bacteria.
 b) Describe in detail amplification.
 c) Explain methods of protoplast fusion.

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M.Sc.(Semester - III) (CBCS) Examination Oct/Nov-2019
Botany

ADVANCED PLANT PHYSIOLOGY AND BIOCHEMISTRY

Day & Date: Thursday , 07-11-2019
Time: 03:00 PM To 05:30 PM

Max. Marks: 70

Instructions: 1) All questions are compulsory.
2) Draw neat and labelled diagrams wherever necessary.

Q.1 Fill in the blanks by choosing correct alternatives given below. 14

- 1) Photolysis of water takes place by photochemical reactions in _____.
a) Photosystem I
b) Photosystem II
c) Photosystem I and Photosystem II
d) Cytochrome b
- 2) Red Drop Effect was studied with isotope _____ of carbon.
a) ^{12}C
b) ^{13}C
c) ^{14}C
d) ^{18}C
- 3) Conversion of Pyruvic acid to Acetyl Co-A requires _____ as a cofactor.
a) Mg^{++}
b) Fe^{++}
c) Zn^{++}
d) Cu^{++}
- 4) _____ phosphorylation produces only ATP molecules.
a) Cyclic
b) Non cyclic
c) Direct
d) Indirect
- 5) _____ acids are relatively non polar.
a) Aromatic amino acids
b) Essential amino acids
c) Shikimic acid
d) Phytic acid
- 6) _____ is a type of secondary metabolite called a Tropane.
a) Atropine
b) Tannin
c) Flavonoids
d) Alkaloids
- 7) About 50% phosphorus from total phosphorus is in _____ form.
a) Inorganic
b) Organic
c) Mineral
d) Absorbed
- 8) VAM plus preparation contains _____ asexual spores.
a) Aplanospores
b) Zoospores
c) Chlamydozoospores
d) Conidiospores
- 9) _____ is found in most high protein food.
a) Cysteine
b) Sulphur
c) Phenol
d) Zinc
- 10) The first reaction in photorespiration is _____.
a) Carboxylation
b) Decarboxylation
c) Oxygenation
d) Phosphorylation
- 11) _____ is the precursor for the formation of aromatic amino acids.
a) Iron
b) Serine
c) Glycine
d) Erythrose 4 phosphate

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M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Botany

PHYTOGEOGRAPHY AND CONSERVATION BIOLOGY

Day & Date: Monday, 04-11-2019
Time: 03:00 PM To 05:30 PM

Max. Marks: 70

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Fill in the blanks by choosing correct alternatives given below. 14

- 1) _____ organization is active for conservation of biodiversity at world level.
 - a) WWF
 - b) WCU
 - c) both a and b
 - d) EE
- 2) Find odd one out _____.
 - a) Nanda devi
 - b) Great Nicobar
 - c) Mannar
 - d) Thar
- 3) _____ type of information is obtained from Red-List.
 - a) Red colored flowers
 - b) Red eyed birds
 - c) Endangered plants and animals
 - d) Red colored insects
- 4) Which option is correct for endemism _____?
 - i) Any group which can be found in small region
 - ii) Any group which can be found in large region
 - iii) Group of species which can be found in definite region
 - iv) Any group which can be not found anywhere else
 - v) Endemic species which can be found everywhere
 - a) i, ii, iii
 - b) i, iii, iv
 - c) ii, iii, v
 - d) only ii and v
- 5) _____ is one of the Hot spot of India.
 - a) Gangatic plain
 - b) Western Ghat
 - c) Eastern Ghat
 - d) Arravali mountain
- 6) _____ is the most appropriate method for conservation of wild life.
 - a) Vaccination
 - b) Hybridization
 - c) conservation in natural habitat
 - d) Killing of predator
- 7) Which pair contains maximum diversity and endemic species in India?
 - a) Sunderban and runn of Kutch
 - b) Eastern Ghat and West Bangal
 - c) East Himalaya and Western Ghat
 - d) Kerala and Punjab
- 8) _____ is the modern concept of conservation.
 - a) Biosphere reserve
 - b) sanctuary
 - c) National park
 - d) Protected forest
- 9) _____ is the endemic tree genera for India.
 - a) *Acacia*
 - b) *Hardwickia*
 - c) *Azadirachta*
 - d) *Magnolia*

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M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Botany
ENVIRONMENTAL PLANT PHYSIOLOGY

Day & Date: Friday, 08-11-2019
 Time: 03:00 PM To 05:30 PM

Max. Marks: 70

- Instructions:** 1) All questions are compulsory.
 2) Figures to the right indicate full marks.
 3) Draw neat, well labeled, complete diagram wherever necessary.
 4) Use of calculators, cell phones or any other electronic gadgets is Prohibited.

Q.1 Fill in the blanks by choosing correct alternatives given below.

14

- 1) CaSO_4 is used for reclamation of _____ soil.
 - a) Acidic
 - b) Alkaline
 - c) Saline
 - d) Marshy
- 2) SO_4 and NO_2 produce pollution by increasing _____.
 - a) Alkalinity
 - b) Acidity
 - c) Neutrality
 - d) Buffer action
- 3) _____ gas of the atmosphere holds up ultraviolet rays.
 - a) Helium
 - b) O_2
 - c) N_2
 - d) CO_2
- 4) Salt glands are present in halophytes showing _____ Phenomenon.
 - a) Salt evasion
 - b) Salt tolerant
 - c) Salt insensitive
 - d) All of these
- 5) In frost injury, ice formation begins at _____.
 - a) Freezing point
 - b) Several degrees below freezing point
 - c) Slightly above the freezing point
 - d) 10°C
- 6) Electrical conductivity of typical saline soil is _____.
 - a) Less than 4ds
 - b) More than 4ds
 - c) Equal to zero
 - d) Not measurable
- 7) Tissue water potential is measured in the units of _____.
 - a) Amperes
 - b) Volts
 - c) Calories
 - d) Megapascals
- 8) Depletion of ozone increases the amount of _____ radiations reaching the globe.
 - a) Visible
 - b) UV
 - c) IR
 - d) Gamma
- 9) An exposure to UV radiations stimulates synthesis of _____ in plants.
 - a) Phenols
 - b) Proline
 - c) Anthocyanins
 - d) Chlorophylls
- 10) _____ is the main target of chilling stress.
 - a) Starch
 - b) Phospholipids
 - c) Proteins
 - d) Chlorophylls

- 11) Potassium ions play an important role in _____.
 a) Stomatal movements b) Proteins synthesis
 c) Cell signaling d) None of the above
- 12) Accumulation of glycine betaine is observed in some crops in response to _____.
 a) Water stress b) Flooding
 c) Pollution stress d) All of these
- 13) Chilling injury occurs when warm region plants are exposed to a temperature of _____.
 a) 0-10⁰C b) 10-15⁰C
 c) 25-35⁰C d) Less than 0⁰ C
- 14) _____ is not a compatible solute.
 a) Proline b) Glycine-betain
 c) Sorbitol d) Malic acid

Q.2 A) Answer the following questions. (Any Four) 08

- 1) What are different types of stresses?
- 2) Define Osmolyte.
- 3) What is mean by photoinhibition?
- 4) Define Ice nucleation.
- 5) Define free radicals.

B) Write Notes. (Any Two) 06

- 1) Causes of soil salinization
- 2) Causes of water logging
- 3) Chilling injury

Q.3 A) Answer the following questions. (Any Two) 08

- 1) Mechanism to overcome salt stress.
- 2) Heat shock proteins.
- 3) Mechanism of UV tolerance.

B) Write Notes. (Any Two) 06

- 1) Effects of salinity stress on plants.
- 2) Mechanism of flooding tolerance.

Q.4 A) Answer the following questions. (Any Two) 10

- 1) Effects of heavy metal toxicity in plants.
- 2) Reactive oxygen species.
- 3) Describe in brief chilling injury.

B) Write notes. (Any One) 04

- 1) Adaptations in plants in response to water stress.
- 2) Effect of SO₂ on plant metabolism.

Q.5 Answer the following questions. (Any Two) 14

- a) Role of proline in plants.
- b) Effects of Air pollutant on plant metabolism.
- c) Write on antioxidants in plant.

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M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Botany
CROP PHYSIOLOGY

Day & Date: Monday, 11-11-2019
 Time: 03:00 PM To 05:30 PM

Max. Marks: 70

Instructions: 1) All questions are compulsory.
 2) Figures to the right indicate full marks.

Q.1 Fill in the blanks by choosing correct alternatives given below. 14

- 1) Which of the growth hormone promotes flowering in LDP?
 - a) Ethylene
 - b) Auxin
 - c) Cytokinin
 - d) GA
- 2) The role of Antitranspirants is to _____.
 - a) Synthesis of florigen
 - b) Synthesis of vernaline
 - c) Check the water loss
 - d) Increase growth of plants.
- 3) In Plant food transport takes place through _____.
 - a) Xylem
 - b) Phloem
 - c) Both a & b
 - d) None of above.
- 4) Permanent and irreversible changes in size, shape and structure of plant is known as _____.
 - a) Growth
 - b) Respiration
 - c) Flowering
 - d) None of these
- 5) Synthesis of florigen hormone takes place in _____.
 - a) Root
 - b) Stem apex
 - c) Leaves
 - d) Fruit
- 6) Which of the following is Organic fertilizer?
 - a) Compost
 - b) DAP
 - c) SuperPhosphate
 - d) Urea
- 7) During Nitrogen fixation Nitrogenase enzyme require _____ condition for proper functioning.
 - a) Aerobic
 - b) Aerobicun
 - c) Both a & b
 - d) None of these
- 8) Following are the PGR _____.
 - a) G.A
 - b) Auxins
 - c) Cytokinins
 - d) All of these
- 9) Long day Plant requires _____ condition for the initiation of flowering.
 - a) Less than 12 hrs Sunlight
 - b) Only 12 hrs Sunlight
 - c) Low temperature
 - d) None of these
- 10) 2-4-D is potential _____.
 - a) Organic Fertilizer
 - b) Weedicides
 - c) Growth promoter
 - d) All

- 11) The role played by fertilizers in Agriculture _____.
 a) Increase fertility of Soil
 b) Increase yield of crops
 c) Improves physico-chemical properties of Soil
 d) All of these.
- 12) Weedicides used to kill _____.
 a) Weeds
 b) Bacteria
 c) Viruses
 d) Fungi
- 13) Richest source of G.A. growth hormone in higher plant is _____.
 a) Immature Seed
 b) Stems
 c) Leaves
 d) Roots
- 14) Central soil salinity research Institute is located in _____.
 a) Jodhapur
 b) Karnal
 c) Bengleru
 d) Lacknow

- Q.2 A) Answer the following questions. (Any Four) 08**
 1) Define harvest index.
 2) Define Antitranspirants.
 3) Define growth.
 4) Any four functions of IAA.
 5) Define Nitrogen fixation.
- B) Write Notes. (Any Two) 06**
 1) Plant growth regulators in agriculture
 2) What is importance of crop physiology in agriculture?
 3) Phloem transport
- Q.3 A) Answer the following questions. (Any Two) 08**
 1) Applications of fertilizers.
 2) Enlist the enzymes synthesised in during fruit ripening.
 3) Methods used for storage of grapes.
- B) Write Notes. (Any One) 06**
 1) Give an account of common weedicides & add a note on mode of action of any one weedicides.
 2) Mention the contribution of UAS in Crop Physiology.
- Q.4 A) Answer the following questions. (Any Two) 10**
 1) Crop growth analysis & its applications.
 2) Research Institute ICRISAT.
 3) Photoperoidism.
- B) Write notes. (Any One) 04**
 1) Types of fertilizers.
 2) Give an account of Fruit Physiology of any one fruits studied by you.
- Q.5 Answer the following questions. (Any Two) 14**
 1) Research contribution of CAZARI in Agriculture.
 2) Explain Physiology of mineral nutrition of ground nut.
 3) Concept of source sink relationship & factors affecting on it.