VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
(Autonomous & Residential)
[Affiliated to Madurai Kamaraj University]

B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Core Subject : Second Semester : Paper – I

PTERIDOPHYTES, GYMNOSPERM AND PALEOBOTANY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. In Pteridophyte, nature of plant body is
   a) Gametophyte b) Sporophyte c) Prothallus d) None of the above
2. *Lycopodium* is commonly known as _____.
   a) Creeping pine b) Trailing pine c) Club mass d) All are correct
3. The *Marsilea* plant is a _____
   a) Parasite b) Sporophyte c) Autotroph d) Saprophyte
4. Which one is found all over the country?
   a) *Marsilea minutum* b) *M. condenseta*
   c) *M. brachycarpa* d) *M. pronensis*
5. *Cycas* plant is
   a) Monoecious b) Dioecious
   c) Polygamous d) None of the above
6. Vallecular canal in *Equisetum* is situated at
   a) below the ridges b) below the furrows
   c) between ridges and furrows d) between the pith and epidermis
7. Palaeo- botany is the study of _____.
   a) Living plants b) Monograph plants
   c) Fossil plants d) Herbarium

8. Fossilized inside the amber contains _____

a) Spores b) Pollen grains c) Minute seed d) All are correct

9. *Rhynia* is a

a) Pteridophyta b) Bryophyta c) Gymnopsperm d) Algae

10. *Rhynia* looks like the

a) *Psilotum* b) *Lycopodium* c) *Marsilea* d) *Equisetum*

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

11. Recall and write the taxonomic position of *Psilotum*.
12. State the steps involved in the fertilization of *Lycopodium*.
13. Illustrate the external morphology of *Marsilea*.
14. Define coralloid roots.
15. Discuss on Impressions.
16. Mention the period of fossil plant *Rhynia*.
17. Write the taxonomic position of *Lyginopteris*.

SECTION – C

Answer ALL Questions : (5 × 5 = 25)

18. a) Paraphrase the internal structure of archegonium of *Lycopodium*, with a *Diagram*.

(OR)

b) Illustrate the external morphology of *Psilotum*.

19. a) Discuss the xerophytic features found in *Equisetum*.

(OR)

b) Describe the T.S of leaf of *Marsilea* leaflet.

20. a) Highlight the economic importance of *Gnetum*.

(OR)

b) Explain the external structure of male cone of *Cycas*.

21. a) Outline the various formation of fossils with suitable examples.

(OR)

b) Classify the geological time scale with suitable plants.

22. a) Paraphrase the internal structure of sporangium in *Rhynia*.

(OR)

b) Enlist and explain the subgenera of *calamites*.

SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

23. Classify and explain the various types of vegetative propagation found in *Lycopodium*.
24. Schematically represent the lifecycle of *Marsilea*.
25. Graphically represent the diplontic life cycle of *Cycas*.
26. Outline the various types of fossils with suitable examples.
27. Summarize the phylogenetic relationship of *Lyginopteris*.

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Core Subject : Second Semester : Paper – II

PLANT ANATOMY AND MICROTECHNIQUES
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Food conducting tissue is
   a) Phloem b) Xylem c) Cambium d) Parenchyma
2. The parenchyma associated with phloem is called as
   a) Phloem parenchyma b) Xylem parenchyma
   c) Collenchyma d) Chlrenchyma
3. Where do the casparian bands occur?
   a) Epidermis b) Endodermis c) Pericycle d) Phloem
4. Closed vascular bundles is a characteristic features of
   a) Dicot stem b) Dicot root c) Monocot stem d) Monocot root
5. Abnormal/anomalous secondary growth occurs in
   a) Dracaena b) Ginger c) Wheat d) Sunflower
6. The cells of root caps in many parts form a constant structure called:
   a) Stele b) Strip c) Medulla d) Columella
7. The skeleton of the leaf is
   a) Tracheids b) Vessels c) Companion cells d) Veins
8. Study of vascular supply to the leaf from stems is
   a) Nodal anatomy b) Anatomy
   c) Internal morphology d) Taxonomy
9. Microtome is used for
   a) Staining b) Sectioning c) Mounting d) Fixing
10. Slicing of plant material is called
    a) Sectioning b) Mounting c) Staining d) All

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. How are the cell wall made up of?
12. Define meristems?
13. List out the most important anatomical features of a stem.
14. Differences of dicot and monocot root.
15. Differentiate the closed and the open vascular bundles.
16. Comment on Amphistomatic leaf.
17. What is microtechniques?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Give an account of the typical structure of plant cell wall. **(OR)**
    b) Write notes on secretary tissues.
19. a) Discuss the primary structure of dicot stem. **(OR)**
    b) Analyse the structure of monocot stem.
20. a) Discuss the secondary thickening of dicot stem. **(OR)**
    b) Anomalous structure of *Dracaena* stem.
21. a) Internal morphology of dicot leaf. **(OR)**
    b) Compare the unilocunar and multilacunor node.
22. a) Write notes on fixation of the plant materials. **(OR)**
    b) Write notes on sectioning of plant materials with reference to hand sectioning.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Explain the different types of simple tissues with suitable diagrams.
24. Explain the anatomical structure of monocotyledonous roots.
25. Describe the anamolous secondary growth in Boerhaavia stem with suitable diagrams.
26. Compare the nodal anatomy of *Justicia* and *Azadirachta*.
27. Give an account of the staining procedures.

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Core Subject : Fourth Semester : Paper – I

CELL BIOLOGY & EMBRYOLOGY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. What is the correct term used for single celled organisms
   a) Monocellular b) Unicellular c) Acellular d) Multicellular
2. The plasmalemma is another term for
   a) Microfibrils b) Cell wall
   c) Plasma membrane d) Middle lamella
3. Chromosome was first seen by
   a) Flemming b) Strasburger c) Nawaschin d) Hofmeister
4. Colchicine, an alkaloid, results in doubling of chromosome number because of
   a) Non-formation of spindle b) Splitting of chromosomes
   c) Double replication of chromosomes d) Non paring of chromosomes
5. Formation of gametophyte directly from sporophyte without meiosis is
   a) Apospory b) Appogamy c) Parthenogenesis d) Amphimixis
6. A diploid female plant and a tetraploid male plant are crossed. The policy of endosperm shall be
   a) tetraploid b) triploid c) diploid d) pentaploid
7. Point out the odd one
   a) nucellus b) embryo sac c) micropyle d) pollen grain

8. The polyembryony commonly occurs in

a) tomato b) potato c) Citrus d) turmeric

9. Eight nucleated embryo sac is

a) only monosporic b) only bisporic

c) only tertrasporic d) Both 'a' and b

10. When a diploid female plant is crossed with a tetraploid male, the ploidy of endosperm cells in the resulting seed is

a) tetraploidy b) pentaploidy c) diploidy d) triploidy

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Comment on incipient nucleus.
12. Expound the functions of ribosome.
13. Differentiate the cytokinesis and karyokinesis.
14. Elucidate the structure of pollen grain.
15. State the significance of embryo sac.
16. Comment on endosperm.
17. What is ruminate endosperm?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Discuss the fluid mosaic model of plasma membrane.

(OR)

b) Describe the structure and functions of chloroplast.

19. a) Give an account of different stages of mitosis.

(OR)

b) Describe the phases of first meiosis.

20. a) Discuss the structure of microsporangium.

(OR)

b) Discuss the developmental stages of male gametophyte.

21. a) Expound the structure of ovule.

(OR)

b) Critically analyze the *Allium* type of embryo sac.

22. a) Explain the nuclear type of endosperm.

(OR)

b) Give an account of development of *Luzula* type of embryo.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Explain the structure and functions of mitochondria.
24. Analyze the phases of second meiosis.
25. Explain the stages of microsporogenesis.
26. Analyze the *Polygonum* type of embryosac.
27. Discuss the *Capsella* type of embryo development.

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Core Subject : Fourth Semester : Paper – II

PLANT ECOLOGY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Father of ecology is _____.
   a) Humbolat b) Haeckel c) Odum d) H. Reiter
2. An association in which one organism is benefitted and the other is neither benefitted nor affected is
   a) commensalism b) competition c) predation d) parasitism
3. Drought escapers are _____
   a) Plants with adaptive features b) Short lived plants
   c) Survive the extreme condition d) Plants die on drought condition
4. Which one is floating hydrophytes_____
   a) Wolffia b) Nelumbo c) Nymphaea d) All are correct
5. Grass lands are
   a) Trees only b) Short herb with grass only
   c) Grass only d) Thick forest
6. The region of tropical moist evergreen forest found in _____
   a) Assam b) Bengal
   c) Andaman and Nicobar d) All are correct
7. The symptoms of pesticides
   a) Respiratory tract irritation b) Sore throat or cough
   c) Allergic sensitization d) All of them

8. DDT (Dichloro- diphenyl trichloroethane) is a _____.
   a) Herbicide b) Insecticide c) Pesticide d) Fungicide
9. Plant species restricted to definite small regions are referred as
   a) endangered species b) cosmopolitan species
   c) endemic species d) threatened species
10. Plants distributed throughout but separated by oceans and overland is known as _____
   a) Continuous distribution b) Discontinuous distribution
   c) Endemics d) Rare

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define Ecology.
12. What are the effect of Edaphic factors on plants?
13. How many types are Hydrophytes? Give examples
14. What are the process of succession?
15. How many methods of studying vegetation?
16. Define pollution and pollutants with examples.
17. Define the continuous distribution with its types.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Describe the effect of light on Plants.

(OR)

b) Give an account on the composition of soil.

19. a) Describe the morphological adaptations of Halophytes.

(OR)

b) Briefly explain the Xerosere.

20. a) Write short notes on Quadrat method.

(OR)

b) Describe the vegetation of TamilNadu.

21. a) Explain the effects of pesticides on plants.

(OR)

b) Describe the effects of pesticides on human life.

22. a) Explain the theories of discontinuous distribution of plants.

(OR)

b) Give an account on the continental drift.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Define biotic factors and describe the interrelationships between plants and animals.
24. Give an illustrated account on the morphological and anatomical adaptations of Hydrophytes.
25. Write an essay on the vegetation of India.
26. Describe the types, ecological effects and control of pesticide pollution.
27. Describe the types of Endemics and add on its mega and microcentres of Endemism in India.

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Core Subject : Sixth Semester : Paper – I

BIOTECHNOLOGY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. In genetic engineering 'molecular scissors' is a
   a) Restriction endonuclease enzyme b) Restriction exonuclease enzyme
   c) DNA ligase enzyme d) Both 'a' and 'b'
2. pBR 322 used as a vector for DNA cloning is
   a) Natural bacterial plasmid b) Engineered bacterial plasmid
   c) Cosmid d) Phagmid
3. Cry genes or Bt genes are obtained from
   a) Cotton pest b) Tobacco plant
   c) *Bacillus thuringiensis* d) *E. coli*
4. Methane content in the Biogas is
   a) ~ 60% b) ~25% c) ~10% d) ~5%
5. PCR stands for
   a) Polynucleotide c-DNA b) Polymeric c-DNA
   c) Polymeric chain reaction d) Polynucleotide chain reaction
6. Nitrogen accounts nearly 79 % of the air, still nitrogen is the most limiting nutrient for plant growth because
   a) N2 cannot be directly utilized by plants
   b) High energy is required to break triple bond

c) Nitrogen is almost an inert gas as N involved reaction requires extreme conditions such as high temperature

d) All of these

7. Which one is green manure

a) Sesbania b) Rice c) Oat d) Maize

8. The leavening or rising of dough is due to which of the following gases?

a) Oxygen b) carbon dioxide

c) hydrogen d) sulphur dioxide

9. Alcoholic fermentation is carried by yeast known as

a) *Wilmot cerevisiae* b) *Saccharomyces cerevisiae*

c) *Lactobacillus* d) *Lactobacillus cerevisiae*

10. High ethanol concentration

a) promotes yeast growth b) inhibits yeast growth

c) promotes bacterial growth d) inhibits bacterial growth

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define Biotechnology.
12. What are ligases?
13. Define gene cloning.
14. What are methanogenic bacteria?
15. Define gene therapy.
16. What are biofuels?
17. Define Genetic Engineering.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Write an essay on restriction endonucleases.

(OR)

b) Describe gene cloning in Saccharomyces.

19. a) Discuss the methods of immobilization of enzymes.

(OR)

b) Write an account on SCP.

20. a) Explain regulation of nif genes.

(OR)

b) Explain rhizobium as a biofertilizer.

21. a) Write a essay on biogas production.

(OR)

b) Describe bioremediation of contaminated soil.

22. a) Give an account on stem cell therapy.

(OR)

b) Explain recombinant insulin production process.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Give the applications of Genetic Engineering.
24. Describe the industrial production process of Penicillin.
25. Give a brief account on Biofertilizers.
26. Write an essay on Phytoremediation.
27. Explain how Monoclonal antibody is produced.

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Elective Subject : Sixth Semester : Paper – I

TISSUE CULTURE
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. What are the parameters needed for in vitro regeneration _____.
   a) Growth medium b) Growth regulators
   c) External environment d) All of the above
2. Which one is not the cytokinins derivatives _____.
   a) Zeatin b) BAP c) Kinetin d) IBA
3. Explants are implanted in _____.
   a) MS medium b) Broth Culture
   c) Nutrient Medium d) All are incorrect
4. Cryopreservation technique preserve the _____.
   a) Seeds b) Tubers
   c) Spores and Pollen grains d) All are correct
5. _____ medium is not used in the somatic hybridization.
   a) MS b) B 5 c) White d) All of the above
6. Haploid plants developed from _____.
   a) Rice b) Wheat c) Tobacco d) All are correct
7. Why need the subculture?
   a) to avoid Nutrient depletion b) to avoid Aggregation of cell mass
   c) to Transfer the organ d) All are correct

8. Which alkaloid is not developed by invitro?

a) Menthol b) Quinones c) Ajmaline d) Nicotine

9. The genes are transfered through _____.

a) Plasmids b) Electroporation

c) Gun method d) All of them

10. 'Bt' is expansion of _____.

a) *Baciolous thuringiensis* b) *Escheria coli*

c) *Bacillus thuringiensis* d) All are incorrect

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define totipotency.
12. What is explant?
13. Define organogenesis.
14. What are cybrids?
15. What is fusogen? Give examples.
16. What are secondary metabolites?
17. What is transgenic crop?

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Narrate the milestones in the history of plant tissue culture.

(OR)

b) Explain the composition and preparation of a plant tissue culture medium.

19. a) What is callus? How will you initiate and maintain a callus culture?

(OR)

b) Explain the steps involved in the production of artificial seeds.

20. a) Describe the methods of protoplast isolation.

(OR)

b) Discuss the uses of haploids in plant breeding.

21. a) Give an outline of the method of cell suspension culture.

(OR)

b) List out the uses of suspension culture.

22. a) Enumerate the applications of tissue culture in horticulture.

(OR)

b) Critically comment on transgenic plants with examples.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Explain the various sterilization techniques employed in plant tissue culture.
24. Enumerate the various approaches of germplasm preservation.
25. With suitable illustrations explain somatic hybridization.
26. Explain the steps involved in the extraction of alkaloids through suspension culture.
27. Describe in detail the production of herbicide resistant transgenic plants.

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Elective Subject : Sixth Semester : Paper – II

BIODIVERSITY CONSERVATION AND MANAGEMENT
Under CBCS – Credit 5

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Approximately 50% of the total world species are present on
   a) Tropical rain forest b) Temperate rain forest
   c) Temperate deciduous forest d) Coral reefs
2. How many protected areas are present in India?
   a) 89 b) 581 c) 492 d) 34
3. Because of deforestation, decreased transpiration leads to
   a) Less cloud formation b) More cloud formation
   c) More water storage d) More oxygen
4. Which option is correct for endemism?
   1. Any group which can be found in small region
   2. Any group which can be found in large region
   3. Group of species which can be found in definite region
   4. Any group which can be not found anywhere else
   5. Endemic species which can be found everywhere
   a) 1, 2, 3 b) 1, 3, 4 c) 2, 3, 5 d) only 2 and 5
5. Our national Aquatic animal is
   a) Elephant b) Tiger c) Lion d) Gangetic dolphin
6. How many mega diversity regions are there?
   a) 12 b) 10 c) 15 d) 20

7. For which animal, Gir National Park is famous?

a) Tiger b) Asiatic Lion c) Leopard d) Deer

8. Three quarters of the earth's surface is covered by

a) Hydrosphere b) Biosphere c) Lithosphere d) Stratosphere

9. 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

10. The objective of CBD is

a) To conserve biological diversity

b) To promote sustainable use of component

c) Fair and equitable sharing of benefit

d) All the above

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. What is succession?
12. Mention the important components of biodiversity.
13. Give an example of an endangered plant and animal species.
14. What is vulnerable species?
15. What are consumptive use values of biodiversity? Give an example.
16. Define national parks with suitable example.
17. Write about biodiversity act.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Why tropics show greatest levels of species richness? Explain.

(OR)

b) Distinguish and explain between species and genetic diversity.

19. a) Write short note on extinct species and rare species.

(OR)

b) What is endangered species? Explain.

20. a) Enumerate the social values of biodiversity.

(OR)

b) Explain about ethical and aesthetic values of biodiversity.

21. a) Briefly explain about sacred groves and their role in conservation.

(OR)

b) Comment on wild life sanctuaries and their importance.

22. a) List out the role of IUCN in biodiversity conservations.

(OR)

b) Explain in briefly about forest conservation act.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Write an essay on community diversity.
24. Discuss about the major causes of biodiversity loss.
25. Give an account of ecosystem service values.
26. Describe about ex-situ conservation methods.
27. Discuss about hot spots of India.

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B.A. / B.Sc. Degree (Semester) Examinations, April 2019
Part – IV : Non-Major Elective Subject : First Semester : Paper – I

GARDENING
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. In a formal garden the imaginary central line is known as
   a) edges b) axis c) focal point d) hedges
2. Which of the following is the quickest method of lawn making?
   a) seedling b) dibbling c) turfing d) truf plastering
3. Main features of English garden
   a) lawn b) rockery c) lanterns d) border
4. Which one is home garden
   a) terrace garden b) sand garden c) stone lantern d) stream
5. Plant suitable for topiary
   a) Tecoma b) Duranta c) Thunbergia d) Clerodendron
6. Plant suitable for Bonsai making and which is easily available
   a) rain tree b) banyan tree c) acacia d) all of these
7. Which breeding method was followed to develop gladiolus varieties Shobha and Subhangini?
   a) Pureline selection b) hybridization
   c) mutation d) progeny selection
8. Which chemical is used for de-greening of fruit?
   a) IBA b) Cytokinin c) Gibberalic acid d) Ethylene
9. India is known as home of _____.
   a) vegetables b) spices and medicinal c) fruits d) flowers
10. Nutrient loving plant is _____.
    a) banana b) apple c) papaya d) citrus

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define Garden
12. What is pureline selection?
13. List out the garden tools.
14. Define rockery garden.
15. What is hanging baskets?
16. What is the needs of organic garden?
17. List out the suitable plants for kitchen garden.

SECTION – C

Answer ALL Questions : **(3 × 9 = 27)**

18. a) Write a note on advantages of gardening. **(OR)**
    b) Give note transplantation methods.
19. a) What is irrigation? Write its methods. **(OR)**
    b) Write values on ornamental garden.
20. a) Explain the Bonsai. **(OR)**
    b) Give a note on advantages of kitchen garden.

SECTION – D

Answer any TWO Questions : **(2 × 14 = 28)**

21. Give a note on different types of garden.
22. Write an account on propagation methods.
23. Give a brief note on indoor garden.
24. Explain the terrace garden and its importance.

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – IV : Skill Based Subject : Fourth Semester : Paper – I

HORTICULTURE
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Which is the most common plant used to propagate in the method of leaf cutting?
   a) *Bryophyllum* b) Mango c) *Coleus* d) *Tectona*
2. Pomology is the study of
   a) Fruit crops b) Vegetables c) Trees d) Flowers
3. Japanese art is
   a) Lawn b) Bonsai c) Rockery d) Trophy
4. Which method of plant propagation involves the use of girdling?
   a) Grafting b) Cuttings c) Layering d) Micropropagation
5. Which grass is called as Buffalo grass?
   a) *Cyanodon* b) *Stenotaphrum* c) Both a & b d) None
6. Indian institute of Horticultural research (IIHR) is located in
   a) Karnataka b) Tamil Nadu c) Kerala d) Delhi
7. Pruning of plants like an object is called as
   a) Topiary b) Pergolas c) Rockery d) Both b & c
8. Human beings need _____ grams of fruits and vegetables per day for Balance diet.
   a) 90/300 b) 100/200 c) 50/100 d) 200/400
9. The upper part of graft is
   a) Scion b) Root stock c) Root d) Shoot
10. *Rhizobium* is a
    a) Biofertilizer b) Green manure c) Manure d) All

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Differentiate between fertilizer and Biofertilizer?
12. Comment on Olericulture.
13. Listout any two binomial names of Grass.
14. Define Smudging.
15. What is Notching?
16. Note on Rockery.
17. What is Astroturf?

SECTION – C

Answer ALL Questions : **(3 × 9 = 27)**

18. a) What is garden? Explain in brief about its parts.

(OR)

b) Define Horticulture. Add it importance.

19. a) Write about any two type of Layering with suitable illustrations.

(OR)

b) Write short notes on Bonsai.

20. a) Listout the important grasses being grown in Lawns.

(OR)

b) What is Drip Irrigation? Listout its Advantages.

SECTION – D

Answer any TWO Questions : **(2 × 14 = 28)**

21. Define Cuttage? Add its various methods of vegetative propagation.
22. Write an essay on a model kitchen garden for a family of five members.
23. How can you establish and maintain indoor gardening?
24. What is Graft? How can you develop a graft?

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – IV : Skill Based Subject : Sixth Semester : Paper – I

GENETICS AND PLANT BREEDING
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Mendel performed his famous hybridization experiments on
   a) *Pisum sativum* b) *Lathyrus sativus*
   c) *Lathyrus odoratus* d) *Nicotiana species*
2. Incomplete dominance is observed in
   a) Wheat plant b) 4 'O' clock plant c) Pea plant d) Gram plant
3. Husband has blood group A and wife blood group B. What is the blood group of children?
   a) A, B, AB and O b) A c) B d) AB
4. Gene responsible for colour blindness is found in
   a) X chromosome b) Y chromosome
   c) X or Y chromosome d) X and Y chromosome
5. Cis-trans experession of genes is an example of
   a) Intragenic crossing over b) Intergenic crossing over
   c) Mutation d) Cytoplasmic inheritance
6. Cholchicine is used to induce
   a) Cell division b) Polyploidy
   c) Cell differentiation d) Cell elongation
7. Mutagen which cause mutation is
   a) Natural b) Induced
   c) Chemical mutation d) Spontaneous
8. The creation of mutation is called
   a) USA b) Belgium c) France d) Brazil
9. High water use efficiency
   a) Flood irrigation b) Sprinkler c) Drip d) All of the above
10. Chromosome number of mango
    a) 2X = 40 b) 4X = 40 c) 3X = 40 d) X = 40

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Define test cross?
12. What is complementary gene?
13. Define incomplete dominance?
14. Define crossing over?
15. What is cross pollination?
16. Importance of plant breeding in horticulture.
17. What is pureline selection?

SECTION – C

Answer ALL Questions : **(3 × 9 = 27)**

18. a) Define Mendel's laws of heredity. **(OR)**
    b) Explain various theories of crossing over.
19. a) Write a mechanism of sex determination in plants. **(OR)**
    b) Explain the gene regulation in prokaryotes.
20. a) Give a note on different types of selection. **(OR)**
    b) Write a note on role of polyploidy in plant breeding.

SECTION – D

Answer any TWO Questions : **(2 × 14 = 28)**

21. Write an account of Dihybrid cross.
22. Explain the multiple alleles with reference to A, B, O blood groups.
23. Give a brief account on methods of pure line selection.
24. Give an account of methods of hybridization.

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – IV : Skill Based Subject : Sixth Semester : Paper – II

REMOTE SENSING AND GIS
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. The Vector data is the form of _____.
   a) Line b) Dot c) Area d) All
2. The Rastor Data is in _____ form
   a) Pixel form b) Area c) Dot d) Line
3. GIS consists of _____.
   a) Data b) Software c) Humanware d) All
4. The recent launch of 104 satellites with a single rocket is a new world record set by
   a) USA b) USSR c) UK d) India
5. Name the launch vehicle used to set the new record
   a) PSLV C37 b) GSLV c) ASLV d) SLV
6. Triangulated Irregular Network (TIN) is used for retaining ___ in a map.
   a) All computed points b) lines c) dots d) none
7. Digital Elevation Model (DEM) is used to measure the _____.
   a) Height of mountains b) Area c) Ocean d) None
8. GIS is mainly used for- _____.
   a) Urban planning b) Software c) Humanware d) Data
9. Name the GIS softwares
   a) Map info b) ArcGIS c) Desk top GIS d) all
10. Name the launch vehicle used to send the 29 satellites
    a) PSLV C45 b) GSLV c) ASLV d) SLV

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. GIS.
12. DEM.
13. TIN.
14. Vector data.
15. Topography.
16. Cartography.
17. Vegetation sensor.

SECTION – C

Answer ALL Questions : **(3 × 9 = 27)**

18. a) Write about RS (Active and Passive) instruments.

(OR)

b) Explain about the GIS applications.

19. a) Write notes on DEM and TIN.

(OR)

b) Write notes on EM Radiation.

20. a) Explain about Launch vehicles and satellites from JAN 2019 onwards.

(OR)

b) Explain the components of GIS.

SECTION – D

Answer any TWO Questions : **(2 × 14 = 28)**

21. Define Remote Sensing and Physical basis of RS.
22. Write an essay on remote sensing applications.
23. Write an essay on GIS.
24. Explain the use of Geographical Information System (GIS) in Urban Planning.

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B.Sc. Botany Degree (Semester) Examinations, April 2019
Part – IV : Skill Based Subject : Sixth Semester : Paper – III

NANOBIOLOGY
Under CBCS – Credit 2

Time: **2** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Ten Hydrogen atoms together equals to
   a) 1 nanometer b) 10 nanometer c) 5 nanometer d) None
2. A nanotube which absorbs light is
   a) Prophyrin nanotube b) Test tube
   c) PVC tube d) Plastic tube
3. Gold nanoshells can find and kill _____ cells.
   a) Cancer b) Lung c) Kidney d) Liver
4. Greygoo is a hypothertical self replicating nanobots that consume all _____ matter on earth.
   a) Living b) Non living c) Water d) Carbon
5. Richard Teynman is a pioneer in the field of _____.
   a) Nanotechnolog b) Biotechnology
   c) Info technology d) Industrial technology
6. The size 10^{-9}m measure is equal to _____.
   a) One Nanometer b) Centimeter
   c) Decimeter d) Meter
7. Agricultural Nanotechnology is used in
   a) Fertigation b) Water quality c) Desalination d) All
8. The nanosize carbon sheet is called as
   a) Graphene b) Graph c) Phene d) None
9. C_{60} carbon molecule is called
   a) Bucky Ball b) Foot Ball c) Cricket Ball d) Ball
10. The country which is pioneer in nano research is
    a) UAE b) USA c) USI d) Japan

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Nanorobots.
12. Nanoshells.
13. Gray Goo.
14. Green Goo.
15. Biosensor.
16. Bottom up.
17. Top down.

SECTION – C

Answer ALL Questions : **(3 × 9 = 27)**

18. a) Define Nanotechnology & its branches. **(OR)**
    b) Mention the various applications of Nanobiology.
19. a) Explain about Nanotubes & Nanowires, Nanocrystals. **(OR)**
    b) Write notes on Dry & Wet nanotechnology.
20. a) Write notes on Bottom up & Top down methodology. **(OR)**
    b) Describe the Primary, Secondary, Tertiary and quaternary structure of protein.

SECTION – D

Answer any TWO Questions : **(2 × 14 = 28)**

21. Give an account about One, Two, Three dimensional nanometerials like Nenotubes etc.
22. Describe the steps of DNA Amplification (Polymerase Chain Reaction).
23. Explain about Top down & Bottom up approach on making nanoproducts.
24. Write notes on the use of nanotechnology in the field of Agriculture.

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M.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Core Subject : Fourth Semester : Paper – I

GENETICS & BIOINFORMATICS
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. When two individuals, differing at least in one character, are crossed, the process is known as
   a) Hybridization b) Selection c) Pedigree d) None of the above
2. Complete linkage present in
   a) Snakes b) Female Drosophila
   c) Male Drosophila d) Birds
3. The creation of mutation is called
   a) Mutagenesis b) Evolution
   c) Salutatory changes d) Radiation
4. The Tool FASTA was developed by _____.
   a) Pearson & Lipman b) Hans c) Tom d) Marc
5. Which of the following type of mutation involves the reverse order of genes in a chromosome?
   a) Deletion b) Duplication
   c) Inversion d) Reciprocal translocation.

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. Who is the father of Genetics? Write his contribution.
7. Comment on single cross over.
8. What is the significance of 9:7 ratio?
9. What is meant by pedigree analysis?
10. What are the multiple alleles? Give an example.
11. What are protein databases? Give an example.
12. Expound : BLAST and FASTA.

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) Write A short account on the basic principles of Mendelism. **(OR)**
    b) Describe the non mendalian inheritance with examples.
14. a) Give an account of Stern's hypothesis and its significance. **(OR)**
    b) Write a short account of mapping in bacteria and its applications.
15. a) Describe the Hardy – Weinberg law and its applications. **(OR)**
    b) Distinguish between Bottle neck effect and Founder effect.
16. a) Describe the procedures submitting sequences to GenBank. **(OR)**
    b) Describe the procedures searching protein via SWISS – PROT.
17. a) Give detailed account of sequence similarity. **(OR)**
    b) Give a detailed account on pairwise and multiple sequence alignment (MSA).

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. Write an account on sex determination in plants with example.
19. Describe the human genome mapping and their importance.
20. List down the factors that alter allelic frequencies.
21. Give detailed account on PDB and NCBI and its significance.
22. Describe the steps involved in the sequence alignments of PAM and BLOSUM. Add note on its significance.

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M.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Core Subject : Fourth Semester : Paper – II

PLANT PHYSIOLOGY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. The rate of diffusion increases if,
   a) The temperature is increased
   b) Density of diffusing particles is lesser
   c) The medium through which diffusion occurs is less concentrated
   d) All the above
2. In plants, transpiration plays an important role in,
   a) Ascent of sap b) Translocation of mineral salts
   c) Regulation of temperature d) All the above
3. In photosynthesis, light energy is converted into,
   a) Heat energy b) O_2 and hexose sugar
   c) Chemical energy d) None of the above
4. C_4-plants differ from C_3-plants in having,
   a) Little or no photorespiration b) Low CO_2 compensation point
   c) Krantz anatomy in their leaves d) All of above
5. Reduced coenzyme NADH is produced in glycolysis during the conversion of,
   a) Glyceraldehydes-3-phosphate to 1,3-bisphosphoglycerate
   b) 3-phosphoglycerate to 2-phosphoglycerate
   c) Glyceraldehydes-3-phosphate to dihydroxyacetone phosphate
   d) None of the above

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. Differentiate between Glyoxysomes and peroxisomes.
7. What do you mean by senescence?
8. Which plants are called CAM plants? Why?
9. What is gluconeogenesis?
10. Write the physiology of Vernalization.
11. Mention the different types of ribosomes and Endoplasmic reticulum.
12. Do circardian rhythm occur in plants? How?

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) Enlist any six importance of macronutrients in physiological functions of plants.

(OR)

b) List any six differences between the chloroplast and the mitochondria.

14. a) Write a brief note on the various stages of seed germination and explain its morphological changes.

(OR)

b) Give a short note on physiology and biochemistry of flowering.

15. a) What are the photosynthetic pigments and LHCs present in plants?

(OR)

b) Trace the biochemical pathway in glycolysis with a schematic diagram.

16. a) Elucidate the structure and functions of lipids.

(OR)

b) Write the biochemical process involved in the glyoxylate pathway.

17. a) How plants are classified based on photoperiodism?

(OR)

b) Explain the various methods to measure the growth of plants?

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. Discuss the active and passive absorption of mineral nutrients in roots based on different theories.
19. What is seed dormancy? Write about the causes, effects and methods to break seed dormancy.
20. Distinguish the main differences in photosynthesis exhibited by C_3 and C_4 plants.
21. Trace the mechanism of Biological nitrogen fixation in plants.
22. Highlight the types, physiological effect, application and mechanism of action of any two plants growth regulators.

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M.Sc. Botany Degree (Semester) Examinations, April 2019
Part – III : Elective Subject : Fourth Semester : Paper – I

RESEARCH METHODOLOGY
Under CBCS – Credit 5

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. Magnifigation of light microscope is
   a) 1500 X b) 2000X c) 1000X d) 2500 X
2. It is widely used to separate and purity biological particles in a liquid medium under applied centrifugal force
   a) Centrifugation b) Microscope
   c) pH meter d) None of the above
3. Number of observations in regression analysis is considered as
   a) Degree of possibility b) Degree of average
   c) Degree of variance d) Degree of freedom
4. Who is the father of research on teaching"?
   a) N.L. Gage b) David Berliner
   c) Egon Brunswik d) Donald T. Campbell
5. NCBI is located in
   a) Bethesda b) Japan c) Korea d) London

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. Resolution.
7. Rf value.

8. FTIR.
9. Beer – Lamberts law.
10. Taq Polymerase.
11. URL.
12. Plagiarism Check.

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) With a suitable illustration explain Density Gradient Centrifugation.

(OR)

b) Furnishing a diagram on the optical path, show how one may create the phase contrast to study a unstained specimen or a microscopic preparation.

14. a) Present the principle, equipment design and utility of the MALDI – TOF.

(OR)

b) Assess the significance of variants introduced in the context of improvising gel electrophoresis.

15. a) Provide the strategy and significance of using micro array.

(OR)

b) Check if DNA finger printing can be a valid and valuable tool in resolving genetic myths and mysteries.

16. a) How and why one would calculate analysis of variance?

(OR)

b) What is a Chi Square Test? Highlight its utility in authenticating results in a research study.

17. a) Enlist the search engines used in browsing web to complementmodern day learning.

(OR)

b) Present the various styles of citing references in the compilation of bibliography.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. Compare image formation and specimen preparation for SEM and TEM and comment on the prowess of the technique in revolutionzing biological enquiries.
19. Drawing layouts for GC and HPLC techniques furnish the working mechanism and show how the eluents are analyzed.
20. Find the utility of blotting techniques in augmenting molecular research.
21. Illustrate as to n how one can present experimental data in different forms in a research paper or a dissertation.
22. Comprehensively review the data bases available to support contemporary research in biosciences.

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B.Sc. Zoology Degree (Semester) Examinations, April 2019
Part – III : Allied Subject : Fourth Semester : Paper – II

TAXONOMY OF ANGIOSPERMS AND PLANT PHYSIOLOGY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(10 × 1 = 10)**

1. Genera Plantarum has
   a) 3 Volume b) 4 Volume c) 2 Volume d) 5 Volume
2. Angiosperms are
   a) Advanced plants b) Primitive Plants
   c) Closed Seed plants d) Both a & c
3. Hooded Connective is the characteristics of
   a) Annonaceae b) Caesalpiniaceae
   c) Asclepiadaceae d) Lamiaceae
4. Translators are found in the family
   a) Asclpiadaceae b) Cucurbitaceae c) Ochidaceae d) Sterculiaceae
5. Transpiration is a process of
   a) Water intake b) Water loss
   c) Water loss in the form of Liquid d) Water loss in the form of vapour
6. Pickles making is a mechanism of
   a) Plasmolysis b) Imbibition c) Absorption d) Adsorption
7. PEP is primary CO_2 acceptor in
   a) C_4 plants b) C_3 plants c) C_2 plants d) Both C_3 + C_4 plants
8. Example of water soluble plant pigment is
   a) Chlorphyll a b) Chlorphyll b c) Anthocyanin d) Xanthophyll

9. Ethylene is responsible for

a) Flowering b) Disease in roots

c) Ripening of fruits d) Formation of fruits

10. Which hormone is responsible for apical dominance?

a) Ethylene b) Auxin c) Gibberellin d) Cytokinin

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

11. Write any four merits of Natural system of classification.
12. Describe the male reproductive part of the plant Calotropis gigantea in the family Asclepiadaceae.
13. Differentiate Transpiration from Guttation.
14. Write short notes on: a) Turgor Pressure b) Plasmolysis
15. How the assimilatory powers of light reaction in photosynthesis are synthesized?
16. What is Vernalization? Who termed this phenomenon?
17. Mention the role of auxin in apical dominance.

SECTION – C

Answer ALL Questions : **(5 × 5 = 25)**

18. a) Write notes on Bentham and Hooker and their contribution to natural system of classification.

(OR)

b) Explain the general characters of the dicot and the monocot plants.

19. a) Mention any five economic importance of the family Caesalpiniaceae.

(OR)

b) Describe the floral characters of the family Annonaceae.

20. a) With a neat diagram explain the phenomenon of Guttation.

(OR)

b) Elaborate the steps involved in Hatch-Slack pathway of C_4 plants.

21. a) Why some plants are called as C_3 and others as C_4? Mention their morphological characteristics.

(OR)

b) Describe the structure of photosynthetic apparatus with a neat diagram.

22. a) What is photoperiodism? Discuss this with reference to short day plants.

(OR)

b) Write any five physiological roles of cytokinins in higher plants.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

23. Describe the Bentham and Hooker's Natural system of classification.
24. Enumerate the general characters of the family Euphorbiaceae.
25. Explain both the Active and the Passive mechanisms of absorption of water by plants.
26. What is Photosynthesis? Give the details of light reactions.
27. What are auxins? Describe their role as growth regulators.