UNIVERSITY OF KERALA

FIRST DEGREE PROGRAMME

IN

BOTANY

UNDER

CHOICE BASED CREDIT- SEMESTER SYSTEM

(w.e.f. 2010 admission)

MODEL QUESTION PAPERS

- Foundation course
- Core courses
- Open courses

PATTERN OF THEORY QUESTION PAPER

Salient features:

- Question paper is set up based on grading system
- The duration of exam for each course is fixed to 3 hours
- The question paper consists of five sections A,B,C & D Section A consists of 16 questions and a bunch of 4 questions carries 1 weightage
- Section B contains 12 very short answer questions of which the candidate can choose 8 and carries 1 weightage each
- Section C has 8 short answer type questions of which the candidate has to answer 5 with a weightage of 1 each
- The last section D consists of 3 questions and the candidate gets the freedom to answer 2 questions with a weightage of 4 each
- Total weightage is 30/paper

MODEL QUESTION PAPERS

UNIVERSITY OF KERALA
SEMESTER-II FOUNDATION COURSE –II
General Informatics and Bioinformatics
(Model question paper)

Course code: BO1221
Time: 3 hrs **Weightage : 30**

SECTION – A

Answer the following

(A bunch of four questions carries **1** weightage)

I. Choose the correct answer

1. The first researcher to sequence a genome in 1977,was

   a. Todd Golub
   b. Frederick Sanger
   c. Craig Venter
   d. Stephen Fodor

2. Microarray gene chips will eventually be used to
   a. Screen for mutations leading to cancer
   b. Identify carriers of genetic diseases
   c. Identify probable behavioral traits
   d. Both a & b are correct
3. The new area of science that seeks to catalog and analyze every protein in the human body in order to help to understand the human genome is called
   a. Bioinformatics
   b. Proteomics
   c. Molecular genetics
   d. Genomics
4. A fast growing new field of Science that seeks to predict the structure of a protein from its nucleotide sequence is called
   a. Genomics
   b. Proteomics
   c. Bioinformatics
   d. Both a and c

II. State ***True*** or ***False***

5. Linux is an operating software
6. WAN is a part of internet
7. Packages are used to write computer programmes
8. SWISS PROT is a protein sequence database.

III. Fill in the blanks with suitable words

9. _____ is software used to plot phylogenetic trees
10. MS WORD is word processor; MS EXCEL is a graphical software and

_____ is a presentation software.

11. Gen Bank is a _____ database.
12. Clustal X is a _____ alignment programme for Windows

IV**.** Select suitable items from A and B.

	A	B
13.	Protein sequences	Pharmacoinformatics
14.	Molecular docking	NCBI
15.	Pharmacogenomics	Interaction of two molecules
16.	Drug designing	Genetic variations and responds to drugs

SECTION- B

Answer any ***Eight***

(Short answer questions*; each question carries a weightage of 1)*

17. How do you differentiate Web browser from Search engine
18. Distinguish between Virus and Worms
19. Explain application software
20. Define free software.
21. What is LAN?
22. Expand SCOP
23. Explain Plagiarism.
24. What is cyber ethics?
25. What is www?
26. Explain any two windows commands.
27. What is a rooted and unrooted tree?
28. What is a search engine?

SECTION- C

Answer any ***Five***

(Short essay- type questions*; each question carries a weightage of 2)*

29. Name two communication protocols.
30. .If you obtain a novel sequence, which database searches would you perform first and why?
31. What are web browsers?
32. Explain molecular modeling.
33. What is bioinformatics? Why is it a multidisciplinary field?
34. What are primary and secondary databases? Explain in detail.
35. What is PDB? Why is it used as a structural database?
36. How can you proceed to find Taxonomic position of the organism through DNA Data

Bank of Japan?

SECTION – D

Answer any two questions (Each carries a weightage of **4**)

37. What are the basic assumptions made in molecular phylogeny? Why is molecular phylogeny preferred to all the other phylogeny methods?
38. What is Information technology? Describe the applications of information technology in various fields. How is it related to the society?
39. Define genomics. Describe about different classes of genomics. What are the applications of genomic analysis and studies?

UNIVERSITY OF KERALA
SEMESTER-I CORE COURSE –I
Methodology and Perspectives of Sciences
(Model question paper)

Course Code: BO 1141
Time: 3 Hrs **Total Weightage: 30**

SECTION- A

Answer **All** (A bunch of four questions carries **1** weightage)

I. Choose the correct answer

1. When several unbiased samples are drawn from the same population, the sampling technique is ----------
   a. Random sampling b. Non random sampling
   c. Non probability sampling d. Purposive sampling

2. Frequency of a discrete variable can be represented by
   a. Line diagram b. Bar diagram c. None of them d. Both of them

3. Sample size depends upon
   a. type of problem investigated b. Resources available
   c. Required precision d. All of them

4. Controlled, repeatable or vigorously verified observation is called
   a. Scientific statement b. Scientific fact
   c. Scientific knowledge d. Practical knowledge

II. State **true** or **false**

5. Explicit knowledge is highly personal and hard to formalize.
6. Characteristics of persons or things which can assume different values are called variables.
7. Characteristics such as sex, colour etc are examples of quantitative observations.
8. The biggest difference between a theory and a law is that a theory is much more complex and dynamic.

III. Fill in the blanks :

9. Phenomena improperly explained as scientific is ----------
10. ---------- may come from careful and logical analysis of problem.
11. --------- is regarded as the father of Biostatics.
12. In ---------- random sampling, population is divided with the number of sections called strata

IV. Answer in **one word** or in one sentence

13. Empiricism
14. Pseudoscience
15. Continuous variables
16. Scientific statement

SECTION-B

Answer any ***Eight***

(Short answer questions; each question carries a weightage of 1)

17. How does Primary data differ from Secondary data
18. Define Null hypothesis
19. What is Induction?
20. Define Theory
21. List out two differences between True Science and Pseudo Science
22. Give the role of Enumerator
23. Describe the revolution in science and technology.
24. "Science can never be truly objective"- Why?
25. What are the different types of knowledge?
26. What is empiricism? Explain in detail.
27. What is Science and what is not Science?
28. Why are samples used in research? What is meant by "representative sample"?

SECTION-C

Answer any ***Five***

(Short essay- type questions; each question carries a weightage of 2)

29. "Ogives are unique type of presenting data." – Explain.
30. "There is no need for hypothesis generation to be a logical process." Discuss.
31. What distinguishes science from other approaches of gaining knowledge?
32. "Science can never be truly objective"- Why?
33. "Census method is better than sampling method". Justify this statement.
34. Describe the revolution in science and technology.
35. Why is critical thinking so important for the progress of science?
36. What is meant by the phrase "Science is theory- laden"?

SECTION- D

Answer **any Two**. (**Each** question carries a weightage of **4**)

37. Describe various methods of classification of data.
38. How do graphs help in the presentation of research findings?.
39. Explain different methods of sampling.

UNIVERSITY OF KERALA
SEMESTER-III CORE COURSE –I
Methodology of Plant Science
(Model question paper)

Course Code: BO 1341
Time: 3 hrs **Total Weightage : 30**

SECTION – A

Answer the following
Draw diagrams wherever necessary

(Questions in bunches of four; Each bunch carries a weightage of 1)

I. Choose the correct answer

1. The amount of light absorbed by a material is proportional to the concentration of the absorbing solution is referred as
   a) Beer's law
   b) Boger-lambert law
   c) Poiseuille's law
   d) all of the above
2. The first patented life form belongs to the kingdom
   a) Plantae
   b) Monera
   c) Protista
   d) Animalia
3. The ratio of diameter of lenses to its focal length is referred as
   a) Magnification
   b) Resolution
   c) Numerical aperture
   d) none of the above
4. pH of pure water is
   a) 7.8
   b) 6.5
   c) 7.0
   d) none of the above

II. Answer in **one** word or in a sentence

5. Expand PAGE
6. Mention the function of Iris Diaphragm in a light microscope
7. Which acts as a stationery phase in paper chromatography?
8. The finding that there was little or no water within the DNA molecule led Watson to build the correct structure of DNA. Who correctly spotted the mistake concerned with water content?

III. State ***true*** or ***false***

9. An observational investigation does not generally start out with a hypothesis
10. The concept of partition coefficient is the basic principle of all chromatographic

methods.

11. DPX is a killing and fixing fluid.
12. PAGE stands for Polyadenylamide gel electrophoresis

IV. Fill in the blanks

13. The technique of isoelectric focussing was discovered by…**……..**
14. The most widely used apparatus for the determination of radioactive isotopes is…….
15. The unit of sedimentation coefficient is known as …….
16. For studying the external morphology of pollen grains, ……..technique is commonly used.

SECTION-B

Answer any ***Eight***

(Short answer questions*; each question carries a weightage of 1)*

17. What is double staining?
18. Stage micrometer and ocular micrometer.
19. Explain Carnoy's formula
20. Describe magnification and resolution of a light microscope.
21.. Expand SEM
22. Distinguish between SDS-PAGE and Native PAGE
23. Give an account of the experimental Designs in Biology with an example
24. Discuss the way in which progress in biology has paralleled the perfection of the microscope.
25. Why must a scientist be careful not to extend his experimental conclusions in organisms other than those with which he worked?
26. What is meant by 'continuity of the germplasm'?
27. List out the various methods used for sterilization of equipments and media
28. Define transmittance and absorbance. What is the difference between these two and how they are related to each other?

SECTION-C

Answer any ***Five***

(Short essay- type questions*; each question carries a weightage of 2)*

29. What do you mean by a phase contrast? How this phenomenon is useful to a biologist?
30. What do you mean by histochemistry and give a list of at least four stains with the type of tissue component stained by each of them?
31. How cryopreservation may injure the tissue and what measures will you take to prevent that?
32. Describe a controlled experiment which demonstrates the following:
    a) The liberation of heat in the germination of seeds.
    b) The affect of light on the direction of growth of shoots
33. What are buffers? Give an account of their application in biological systems and research.
34. Discuss the principle and technique of Gas liquid Chromatography

35. What is herbarium? Describe the technique of preparation of herbarium specimen.

36. Give a historical perspective of research in Botany

SECTION-D

Answer any ***Two***

(Essay- type questions; Each question carries a weightage of 4)

37. A plant physiologist observed the following deficiency symptoms in a plant. Leaf Necrosis, Leaf Chlorosis,Poor flowering and fruiting and Shedding of leaves

Develop a hypothesis to explain each of the above observations. Then Design an experiment or experements to test your hypothesis,

38. (a) Why certain substances or solutions appear to have a particular color? How this property is useful in estimating the concentration of such substance in a solution?

(b) Explain the principle, technique and application of centrifugation in biology.

39. Describe the various steps involved in the preparation of a permanent serial section.

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SEMESTER- IV CORE COURSE - I

Angiosperm Anatomy, Reproductive Botany and Palynology
[Model question paper]

Course code: BO 1441

Time: 3 Hours **Maximum Weightage: 30**

SECTION – A
Answer the following

Draw diagrams wherever necessary

(Questions in bunches of four; Each bunch carries a weightage of 1)

I. Choose the correct answer

1. A living mechanical tissue.
   (a) Parenchyma (b) Collenchyma (c) Chlorenchyma (d) Sclerenchyma
2. In dicot stem vascular bundle is
   (a)Radial (b) Closed (c) Exarch (d) Open
3. Quiscent centre is associated with.
   (a)Root tip meristem (b) Shoot tip meristem (c) Intercalary meristem (d) Lateral meristem
4. Stele includes all the tissue inside
   (a)Hypodermis (b) Starch sheath layer (c) Pericycle (d) Vascular cambium

II. Answer in **one** word or in a sentence

5. Bulliform cells
6. Sporopollenin
7. Tapetum
8. Epithem

III. State ***true*** or ***false***

9. The chief chemical constituent of exine is cellulose
10. In a dicot leaf guard cell is dumbell shaped
11. Secondary cortex is derived from phellogen
12. Grass stem can elongate after initial growth because of apical meristem

IV. Fill in the blanks

13. Lateral roots originate from-------
14. Histogen theory was proposed by -----
15. Pollen tube is formed from the -------
16. The ovule which shows 90^{o} curvature is --------

SECTION – B
Answer any ***Eight***

(Short answer questions; each question carries a weightage of 1)

17. Direct embryogenesis is the advanced tissue culture technique. Discuss
18. Sclerenchyma is a mechanical tissue. Comment
19. How does Alburnum differ from duramen?
20. Distinguish between Ring porous wood and diffuse porous wood
21. List two differences between Orthotropus and Campylotropus ovule
22. Mention the functions of antipodals
23. Coconut shells are hard, to protect the inner tissues. Name the mechanical tissue associated with it. Mention its important characteristic features.
24. The component of the cell wall in different simple tissues shows much variation, which

help them to differ in their functions. Comment

25. Trees are said to be having a record of their age inside them 'Is it true'? Explain
26. General plan of arrangement of vascular tissues in the roots of Pea and Colocasia is similar. But there are differences also. Bring out the similarities and differences.
27. Describe the extrastelar thickening in Dicot stem
28. A group of specialized cells perform conduction of water and food in Angiosperms.

SECTION – C

Answer any ***Five***

(Short essay- type questions; each question carries a weightage of 2)

29. Collenchyma and Sclerenchyma gives mechanical support to plant parts. Substantiate the statement
30. All fruits are produced from the ovary of fertilized flower. Write an expception to this statement and explain
31. Give the detailed structure of a mature anther
32. Dicot stem usually shows secondary thickening. But some dicot plants show anomalous secondary thickening. Evaluate with suitable example
33. Archeological department found a piece of plant part while excavating a region. They want to know the plant part whether it is stem or root. How will you differentiate? Giving reasons?
34. Explain the organization of the shoot apex by Apical cell theory and Tunica-Corpus Theory
35. When the stem of Rubber plant is cut, white exudates come out.
    (a) Name the exudates
    (b) Name the part associated with the secretion
    (c) Point out its features.
36. What are the three types of endosperm formation found in plants? Give an example of liquid endosperm

SECTION-D

Answer any ***Two***

(Essay- type questions; Each question carries a weightage of 4)

37. Activity of vascular cambium in the stem of majority of plants is normal. But some plants show variation in its activity. Name the term given for such type of variation and explain the variation with reference to a plant you have studied.
38. In animals, growth stops after a period of time. But in plants growth continues. Name thetissue involved in this activity. What are the special characters of this tissue? Based on its position and origin classify them and explain compare it with root apex
39. Haploid plants are economically viable. In vitro culture of haploid plants is normally done through the process of tissue culture. How it is achieved?

UNIVERSITY OF KERALA
SEMESTER-V CORE COURSE –I
Microbiology, Phycology, Mycology, Lichenology & Plant Pathology
(Model question paper)

Course Code : BO1541
Time: 3 hrs **Total Weightage: 30**

SECTION – A
Answer the following

Draw diagrams wherever necessary

(Questions in bunches of four; Each bunch carries a weightage of 1)

I. Choose the correct answer

1. Floridean starch is the food product found in
   a) Chlorophyceae b) Phaeophyceae c) Rhodophyceae d) Xanthophyceae
2. *Rhizopus* multiplies by the production of
   a) Zoospores b) conidiospores c) sporangiosp d) chlamydospores
3. Many gram-ve bacteria are covered with fine hair-like appendages called
   a) Sex pili b) fimbriae c) flagella d) axial fibrils
4. Usnea lichen is
   a) Fruticose b) Foliose c) Crustose d) None

II. State ***true*** or ***false***

5. Plakea stage of *Volvox* is a tetrad
6. *Sargassum* plant is a sporophyte
7. The dikaryotic mycelium of *Puccinia graminis* is seen in Wheat leaf.
8. The three phases in sexual reproduction of fungi are plasmogamy, karyogamy and meiosis.

III. Fill in the blanks

9. Citrus canker is caused by _____
10. Agar agar is obtained from _____
11. The synzoospores are found in _____
12. Algal partner of the lichen is known as _____

IV. Match the following.

A	B
13. Phycoerythrin	Coenocyte
14. Fucoxanthin	Soap dish type
15. Frustule	Laminarin
16. Absence of pigment	Floridean starch

PART B
Answer any ***Eight***

(Short answer questions; Each question carries a weightage of 1)

17. Define heterothallism
18. Distinguish between anisogamy and oogamy

19. Distinguish between Eukaryotes and Prokaryotes.
20. Mention the functions of pyrenoids
21. What is heterocyst?
22. Mention the group of the organism which causes 'Rot' disease
23. Comment on the function of air bladder in *Sargassum*.
24. Economic Importance of Fungi?
25. Enumerate the symptoms of Quick Wilt of Pepper
26. General characteristics of bacteria.
27. What are teleutospores?
28. List down your comments about the physiological relationships between the Algal and Fungal partners of Lichen.

Section C

Answer any ***Five***

(Short essay- type questions; each question carries a weightage of 2)

29. Analyse the following statements and write any two statements applicable to appropriate columns given below.

Related to Algae	Related to Fungi

i) Non chlorophyllated thalloid and heterotrophic.
ii) Notorious for food spoilage.
iii) Autotrophic and chlorophyllated.
iv) Parasitic or saprophytic in habit.
v) Classified according to the colour of their photosynthetic pigments.

30. Write about the economic importance of algae.
31. Explain the general characteristics of Cyanobacteria.
32. Give an account of the thallus variation found in the members of chlorophyceae with suitable diagrams.
33. List any four resemblances and four differences between basidiomycetes and ascomycetes
34. Write an account on asexual reproduction in Algae
35. Give an account of habit, structure and method of reproduction of *Nostoc.*
36. With the help of diagram describe the internal features of *Peziza* apothecium.

Section D

Answer any ***Two***

(Long-essay type questions; each question carries a weightage of 4)

37. In *Puccinia graminis tritici* both heterothallic and heteroecious conditions occur. Illustrate your answer with suitable sketches
38. Describe the structure and reproduction of Polysiphonia with the help of suitable diagrams. Add a note on its life cycle.
39. Describe the different methods of reproduction in volvox with the help of suitable diagrams.

SEMESTER V – CORE COURSE -II
Bryology, Pteridology, Gymnosperms and Palaeobotany

Course Code: 1542
Time: 3 hours **Total weightage: 30**

SECTION- A

Draw diagrams wherever necessary

(Questions in bunches of four; Each bunch carries a weightage of 1)

I. Choose the correct answer

1. .Antheridium bearing branches in Marchantia are
   a) Archegoniophore b) Antheridiophore c) Semiandrophore d) Vasculature

2. Tuberculated rhizoids are found in
   a) Riccia b)Anthoceros c) Polytricum d) None of the above
3. In Lycopodium the Strobili are
   a) Homosporous b) Heterosporous c) Monosporous d) None of the above

4. Wood in Pinus is
   a)Manoxylic b)Pycnoxylic c)Diploxylic d)Polyxylic

II. Answer in one word or one sentence

5. Prothallus
6. Elaters
7. Pitting in Cycas
8. Lagenostoma

III. State **true** or **false**

9. Lyginopteris is a fossil pteridophyte
10. Sporocrp is seen in Marselia
11. Birbal Sahni is a Paleobotanist
12. Transfusion tissue is found in the corolloid roots of Cycas

IV. Fill in the following

13. Riccia belongs to the class ……
14. …….. is a heterosporous Pteridophyta
15. Bract scales are seen in the ……. Cone of Pinus
16. Sporophytes of Mosses are semiparasitc on the ……

SECTION – B

Answer any ***Eight***

(Short answer questions; Each question carries a weightage of 1)

17. Anthoceros exhibit symbiosis. Substantiate.
18. Apogamy and Apospory are common in pteridophytes. Suggest reason.

19. What is the ovule bearing structure in Lyginopteris?
20. How is vegetative reproduction taking place in Marchantia?
21. Explain heterophylly in Pteridophytes
22. Conduction of water takes place in polytrichum – Explain.
23. Bryophytes play a major role in soil formation and conservation. Discuss.
24. Mention the advanced characters of the capsule of Polytrichum.
25. Describe polystelic stem in pteridophytes.
26. Mention the differences in root characters of Cycas and Pinus.
27. Why is Gnetum considered as an advanced gymnosperm?
28. Mention the salient features of any fossil gymnosperm.

SECTION – C

Answer any ***Five***

(Short essay- type questions; each question carries a weightage of 2)

29. Which is the predominant period of gymnosperms?
30. Describe the coralloid root of Cycas.
31. What are synangia?
32. Mention the important characters of Bryophytes
33. Describe the anatomical features of Equisetum stem.
34. What are Cycado filicales?
35. Describe the reproductive structure in Gnetum.
36. Comment on the morphological peculiarities of Selaginella.

SECTION – D

(Answer any **two** of the following. Each question carries a weightage of **4**)

37. Describe the life cycle of Lycopodium.
38. Explain the evolutionary aspects in the ovules of Cycas, Pinus and Gnetum.
39. Importance and evolutionary trends of Bryophytes.

UNIVERSITY OF KERALA
SEMESTER V- CORE COURSE- III
Plant Physiology and Biochemistry
[Model Question paper]

Course Code: 1543
Time: 3 Hours **Total Weightage: 30**

SECTION – A
Answer the following

Draw diagrams wherever necessary
(Questions in bunches of four; Each bunch carries a weightage of 1)

I. Choose the correct answer

1. What will the nature of sugar solution, if the cells of an epidermal peal of *Rhoe discolor* shows plasmolysis
   (a)Hydrophobic (b) Hypertonic (c) Isotonic (d) Hypotonic
2. Potometer and Clinostat are used to study
   (a)Phototropism and geotropism (b) Transpiration and geotropism (c) Transpiration (d)Photosynthesis
3. Guttation occurs through
   (a)Stomata (b) Hydathodes (c) Root hairs (d) Flower buds
4. Whiptail of crucifer is due to deficiency of
   (a)Zn (b) P (c) Mo (d) Cu

II. State ***true*** or ***false***

5. Role of nitrifying bacteria in nitrogen cycle is to convert ammonia into nitrogen
6. According to munch hypothesis osmotic pressure remains high in the mesophyll cells due to accumulation of salts by xylem
7. If the respiratory substrate is rich in oxygen RQ will be less than 1
8. Photosynthesis is the maximum in green light

III. Fill in the blanks

9. Co_2 acceptor in C_3 plants is -----
10. Total ATP production during EMP pathway is -----
11. Garner and Allard are related with -----
12. Wilkins X ray diffraction showed the diameter of the DNA helix as ------

IV. Answer in one word or in one sentence

13. Photolysis
14. Photoperiodism
15. Chemotropism
16. Phosphorylation

SECTION – B

Answer any ***Eight***

(Short answer questions; Each question carries a weightage of 1)

17. What is active absorption of water?
18. Define D.P.D
19. What is guttation?
20. Distinguish between Drought stress and salinity stress.
21. What is chemotaxis?
22. How does Ex-osmosis differ from end-osmosis
23. Comment upon "Transpiration as a necessary evil"
24. Explain foliar transpiration and describe the mechanism of opening and closing of stomata
25. Describe the physiological applications of "Auxins"
26. Give an account of ß oxidation
27. Explain non cyclic photophosphorylation
28. Explain the mechanism of mineral salt absorption

SECTION-C

Answer any *Five*

(Short-essay questions; each question carries a weightage of 2)

29. Write a note on critical photoperiod.
30. What are the causes of seed dormancy?
31. The cell sap of the roots of halophytic plants has normally higher osmotic pressure than that of the cell sap of mesophytic plants.why?
32. Give an account of the carbon dioxide fixation in succulent species.
33. Comment on the amphibolic nature of citric acid cycle.
34. Write a note on the regulation of citric acid cycle
35. Explain the biochemistry of nitrogen fixation
36. What is an action spectrum? What is the relationship between the action spectrum for photosynthesis and the absorption spectrum of chlorophyll?

SECTION-D

Answer any ***Two***

(Long-essay type questions; each question carries a weightage of 4)

37. Describe the different steps whereby a molecule of glucose is oxidized to CO_2 in glycolysis and the citric acid cycle. In what steps is CO_2 released, and in what steps is energy conserved?
38. Explain the process of root nodule formation in leguminous plants infected by rhizobium. Give a detailed account of the biochemistry of nitrogen fixation.
39. Give a detailed account of enzyme classification

SEMESTER –VI CORE COURSE-I

Angiosperm Morphology, Systematic Botany, Economic Botany, EthnoBotany and Pharmacognosy

(Model question paper)

Course code: BO1641

Time: 3 Hours **Total weightage: 30**

Draw diagrams wherever necessary

SECTION A

Answer **all** questions (Each question carries a weightage of 1)

I. Choose the correct answer

1. In epigynous flowers the ovary is
   a. Superior b.Inferior c. Half superior d. None of the above
2. Cat kin is a
   a. Inflorescence b.Fruit c. Seed d. flower
3. Flower bud is the morphology of useful part in
   a. *Syzygium aromaticum* b. *Pisum sativum* c. *Piper nigrum* d. *Zingiber officianale*
4. Linnaeu's sexual system of classification is an example for
   a.Natural system b. Artificial system c. Phylogenetic system d. None of the above

II. .Answer in one word or one sentence

5. Parietal placentation
6. Cypsela
7. Zygomorphic flower
8. Accrescent calyx

III. State ***true*** or ***false***

9. The stamens are didynamous in Verbenaceae
10. Syngenesious stamens are found in Asteraceae.
11. Interpetiolar stipule is an identifying feature of Rutaceae
12. The product of *Acacia senegal* is a resin

IV Fill in the blanks

13. *Achras sapota* belongs to the family……
14. …… is the useful part of Bengal gram.
15. In Orchidaceae the pollen grains appear as …….
16. The inflorescence is a ……. In Leucas.

SECTION – B

Answer any ***Eight***

(Short answer questions; Each question carries a weightage of 1)

17. Discuss the role of Herbaria in Taxonomic studies
18. The family Cucurbitaceae though possess gamopetalous corolla is placed under the sub class Polypetalae. Comment on
19. The flowers of Annonaceae are Spirocyclic. Why?
20. Give a short account on the importance of Ethnobotany.
21. Comment on the adnation seen in the Family Solanaceae
22. How does a Drupe differ from a Berry?

23. The flowers of *Caesalpinia pulcherrima* and *Pisum sativum* bear gynoecium of monocarpellary unilocular ovary with marginal ovules. But they are placed under two separate sub families. Why?
24. Define the term Pharmacognosy and give a short account on its scope.
25. Write notes on Fossil angiosperms.
26. Give the binomial, family and morphology of the useful parts of Henna andCotton.
27. Differentiate the essential organs of Apocynaceae from that of Asclepiadaceae
28. Poaceae is considered to be an advanced family. Substatiate the statement giving evidences.

SECTION- C

Answer any **Five** questions (Each carries a weightage of **2**)

29. With the aid of diagrams describe the structure of Cyathium and Hypanthodium
30. What are the salient features of Scrophulariaceae?
31. Write a brief account on the classification of fruits
32. Discuss the method of cultivation of Coconut mentioning the botanical name, family, morphology of useful part and uses.
33. Write notes on any four plants used by the tribes for curing diseases.
34. Give a short account on the drugs obtained from the underground parts of plants.
35. Describe the family characters of Anacardiaceae. Mention the botanical names of any two economically important plants of the family specifying the importance.
36. What is meant by floral diagram? Construct the F.D and write the Floral formula of a named plant belonging to the family Malvaceae.

SECTION- D

Answer any **Two** questions (Each carries a weightage of 4)

37. With the help of diagrams make a comparative study on the floral features of the sub families of Scitaminae.
38. Flower is a modified shoot. Discuss the statement with illustrations and examples.
39. Give a detailed account of Bentham and Hooker's system of classification. Write a note on its merits and demerits.

UNIVERSITY OF KERALA
SEMESTER -VI CORE COURSE -II
Cell Biology, Genetics, Plant Breeding and Evolutionary Biology

Course Code: BO1642
Time: 3 Hrs **Total Weightage: 30**

SECTION – A
Answer the following

Draw diagrams wherever necessary
(Questions in bunches of four; Each bunch carries a weightage of 1)

I. Choose the correct answer
1. Cell theory states that cells are the basic structural and functional unit of life. This idea was put forth by
a) Watson & Crick b) Schleiden & Schwan c) Bateson & Punnett d) Wilkins & Franklin
2. Inter nuleosomal DNA is called
a) Linker DNA b) linear DNA c) Junk DNA d) None of the above
3. A trisomics will have a chromosome complement
a) 2n-1 b) 2n-1-1 c) 2n+1 d) 2n+2
4. A genotypic ratio 9:3:4 indicates
a) Dominant epistasis b) recessive epistasis c) complementary interaction d) non epistasis

II. State ***true*** or ***false***
5. During Meiosis crossing over occurs at zygotene stage
6. A cross of F_1 and its dominant parent is called test cross
7. Genes with small but equal effect on the phenotypes are called polygenes
8. Erythroblastosis foetalis results when father is Rh^{+ve} and mother Rh^{-ve}

III. Fill in the blanks
9. Classical blood group with no antigen is ------
10. *Raphanus sativus* × *Brassica oleracea* is an example for ……hybridisation
11. A particular organism has a chromosome number 2n= 16. The probable number of linkage groups in it will be -------
12. -------- is the chromosome complement of a Klinefelter's syndrome patient

IV. Answer in one word or in one sentence
13. Transcription
14. Pleiotropy
15. Epistasis
16. Multiple alleles

SECTION – B
Answer any ***Eight***
(Short answer questions; Each question carries a weightage of 1)

17. Distinguish between *hn* RNA and *m*RNA
18. Explain Wobble hypothesis
19. What are Transposons? and retrotransposons

20. Replication and Transcription.
21. What is meant by Degeneracy of the genetic code?
22. Mention the differences between Transcription and translation
23. The given diagram represents a particular stage in a special type of chromosome

a) What is the name given to this condition?
b) Name the type of chromosome in which it occurs

24. When two white varieties of sweet pea are crossed, the progeny produced were 1125 coloured and 875 colourless
    a. Identify the gene interaction involved
    b. Who reported this?
25. When a cross is made between two *Nicotiana* plants with genotypes s_1s_2, no pollen tube reached the ovules to effect fertilization
    a. What type of interaction is expected here
    b. What is the reason for this phenomenon?
26. ATP is a nucleotide
    a. What is a nucleotide?
    b. What are the components of ATP?

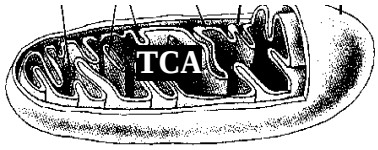
27. Explain how does pure line selection differ from mass selection?
28. Differentiate between parallel and convergent evolution

SECTION- C

Answer any **Five** questions (Each carries a weightage of **2**)

29. The given diagram depicts a cellular process.

Glycolysis



a. Identify the process involved
b. What is the connecting molecule between the two steps indicated?

30. In the ABO blood system in human beings ,alleles I^A and I^B are co dominant and both are dominant to the I allele . In a paternity dispute , a type AB woman claimed that one of four men ,each with different blood types, was the father of her type A child.Whichof the following could be the blood type of the father of the child on the basis of the father of the evidence given?

a. Type A
b. Type AB
c. Type O

d. Type B

31. Draw the tautomeric form of adenine and cytosine
32. Write a brief account on chromosomal structural aberrations
33. With the help of a diagram describe the fluid mosaic model of a cell membrane
34. What are non epistatic genes? How do they modify classical dihybrid phenotypic ratios?
35. Explain the genic balance theory of sex determination
36. Give an account of Plant introduction and add a note on major achievements in India

SECTION-D

Answer any ***Two***

(Long-essay type questions; each question carries a weightage of 4)

37. What are special types of chromosomes? Explain the structure and organisation of any two
38. In Drosophila grey body colour 'B' is dominant over black body 'b'. If the hybrids of two are inbred what would be the genotypes and phenotypes produced? When a total of 452 offsprings are produced what would be the number of each phenotype?
39. Explain polygenic inheritance with suitable examples. How do the polygenes differ from Mendelian genes?

SEMESTER -VI CORE COURSE-III

Environmental Studies and Phytogeography
[Model question paper]

Course Code: BO1643
Time: 3 Hrs **Total Weightage: 30**

SECTION – A
Answer the following

Draw diagrams wherever necessary
(Questions in bunches of four; Each bunch carries a weightage of 1)

I. Choose the most appropriate answer
1. Trophic levels are formed by
(a)Only plants (b) Only animals (c) Only carnivores (d)Organisms linked in food chains
2. The pyramid of energy is
(a)Always erect (b) Always inverted (c) Errect or inverted (d) None of these
3. Deforestation reduces the chance
(a)Rain fall (b) Frequent cyclones (c) Soil erosion (d) Land slides
4. Lichens are important in the study of atmosphere pollution because they
(a)Can grow well in polluted atmosphere (b) Can purify the atmosphere (c) Are sensitive to pollutant (d) None of these

II. State ***true*** or ***false***
5. Every year, 5th June is celebrated as World environmental day
6. Acid rains are caused by increased atmosphere concentration of NH3 and SO_3
7. National park is an example of *ex-situ* conservation
8. Forest is a type of renewable resource.

III. Fill in the blanks
9. Ecosystem with maximum primary productivity is …….
10. The two major vegetation types in India are ……and ……..
11. Age and area theory was proposed by ……
12. The elimination of ……type of species will seriously affect the ecosystem.

IV. Answer in one word or in one sentence
13. Integrated afforestation
14. Psammophyte
15. 'Hot spot'
16. Endemism

SECTION – B
Answer any ***Eight***
(Short answer questions; each question carries a weightage of 1)

17. How does Habitat differ from niche?
18. Distinguish between Biomagnification and bioaccumulation
19. List two differences between Primary succession and secondary succession
20. How does Alpha diversity differ from beta diversity?

21. Explain Hydrologic cycle
22. Differentiate Green house effect from glass house effect
23. The following is sequence of individuals linked though food
    Wheat? rat? cat? dog? lion
    a. What is this sequence called?
    b. Which one represents the primary consumer?
24. In a particular locality, the organisms and the surrounding are reciprocally related.
    a. What is the name given to such an integrated system?
    b. What is the driving force of such a system?
25. Cactus plants can grow in areas exposed to drought
    (a)To which group does cactus belong? (b)How do these plants manage drought?
26. Epiphytes develop a special tissue to absorb moisture from the atmosphere.
    a. Name the tissue
    b. What is the layer determine it?
27. Pollutants after production may often interact.
    a. What is the name given to the product of interaction?
    b. Give an example for such product.
28. Enumerate the benefits of forest resources

SECTION – C

Answer any ***Five***

(Short essay- type questions; each question carries a weightage of 2)

29. Mining posses several long term occupational hazards to the miners. Substantiate.
30. Given an account of ecological pyramids
31. List out the effect of air pollution.
32. What is a food web? Why should there be food webs rather than food chains in nature?
33. Write a note on the different types of succession.
34. How can you conserve forest resources?
35. Discuss the methods for solving/reducing air pollution
36. Bring out the significance of mangrove vegetation

SECTION-D

Answer any ***Two***

(Long-essay type questions; each question carries a weightage of 4)

37. What is sustainable development? Explain with reference to global environmental crisis.
38. What is *in situ* conservation? Explain the different types of protected site. Add a note on environment (protection) act
39. Write an account on the phytogeographic regions of India.

SEMESTER-V OPEN COURSE- I(a)

HORTICULTURE

[Model Question Paper]

Course code: BO1551.1

Time: 3Hrs **Total Weightage=30**

Draw diagrams only when specified

SECTION- A

(Answer all questions. A bunch of 4 questions carries **1** weightage)

I. Choose the correct answer

1. Name a method by which you can grow a large woody plant inside your room

   a) Horticulture b) Bonsai c) Tissue culture d) Olericulture

2. Choose a fungicide from the following

   a) 2, 4-D b) Bordeaux mixture c) Streptomycin d) None of the above

3. How would you clear up the leaf litter in your garden?

   a) Garden rake b) Pruning shear c) Secateur d) Hand rake

4. The method of vegetative culture is called ----------

   a) Pomology b) Olericulture c) Sylviculture d) Arboriculture

II. Fill in the blanks

5. Pomology is ----------

6. Rubin wished to adorn his garden with a statue. This method is called -----

7. ------- are called the primary nutrients in plants

8. A natural green carpet of garden in called----------

III. True or false

9. Mycorrhizae are beneficial fungi that grow in a plant, symbiotic relationship on the root

10. Growing of two or more vegetable crops in the same field at the same time is called mixed cropping

11. Removal of moisture under controlled conditions of temperature, humidity and flow of air is called scarification

12. Post harvested treatment given to vegetables for fast healing of mechanical injury, lowering the moisture contact and reducing the rotting of fungal growth is called curing

IV. Match the following

13. Snake gourd - *Momordica charantia*
14. Bitter gourd - *Lycopersicon esculentum*
15. Ladies finger - *Trycosanthes anguina*
16. Tomato - *Abelmoschus esculentus*

SECTION-B

Answer any **four** of the following: (Each question carries a weightage of **1**)

17. Mention the differences between Rockery and Topiary
18. Define olericulture
19. Describe hedges and edges
20. Differentiate between irrigation and fertigation
21. What is tipping?
22. Why orchids are not propagated by seeds?
23. What is the significance of glass houses in Horticulture?
24. What may be done to increase the storage of some cut flowers?
25. During rooting periods of bulbs and corms, soil should be low in nitrates- explain.
26. What are suckers? How suckering can be promoted?
27. Write a critical note on drip irrigation.
28. What is Bonsai?

SECTION – C

Answer any ***Five***

(Short essay- type questions; each question carries a weightage of 2)

29. Briefly describe the method of potting orchid plants.
30. Write briefly on the cultivation methods used in Anthurium. Give the name of two commonly cultivated varieties
31. Describe at least three different types of layerage and indicate their special applications.
32. What are the measures to be adopted for raising a roof garden?
33. What are the advantages of vermin compost and other manures?
34. Explain the type and components of a conservatory
35. Write on the principles involved in the selection of plants for bouquet and garland making.

36. Give an account of topiary and garden architecture.

SECTION- D

(Essay type question. Answer any ***Two*;** each question carries a weightage of **4)**

37. Describe the various steps to grow Bonsai.

38. Describe the recent trends in the commercialization of horticulture. Add notes on cut flower industry.

39. Give an account of the different types of growth regulators and their uses in Horticulture.

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SEMESTER-VI OPEN COURSE- I

BIOTECHNOLOGY AND NANOBIOTECHNOLOGY

[Model Question Paper]

Course code: BO1651

Time: 3Hrs **Total Weightage=30**

Draw diagrams only when specified

SECTION- A

(Answer all questions. A bunch of 4 questions carries **1** weightage)

I. Choose correct answer

1. Mohan isolated a gene 2600bp long, which he desires to cut into two. Which molecular tool would he use?

   a) Ligase b) Restriction enzyme c) DNA polymerase d) Klenow fragment.

2. The forensic scientist obtained a small blood stained cloth of the suspect from the crime site. Which technique can be used to obtain sufficient amount of DNA present in the blood stain for further analysis?

   a) PCR b) pH meter c) Western blotting d) Northern blotting

3. Which technology involves combining two cells without cell walls from different species?

   a) Clonal propagation b)somatic embryogenesis c) protoplast fusion d) somaclonal variation

4. Anitha inoculated a leaf segment into a medium containing auxins and cytokinins. After a month, she observed a white mass of cells in the culture. Name it.

   a) meristem b) callus c) shoot tip d) callose

II. Answer in **one** word or **one** sentence

5. Anther culture
6. Totipotency
7. Cryopreservation
8. Cybrid

III. State ***true*** or ***false***

9. Human Genome Project was very successful in determining the functions of over 80% of the genes located in 46 chromosomes
10. Ø x174 has a double strandedRNA

11. Cybrids are synonymous to synthetic seeds
12. HEPA type of filter is located in Laminar air flow

IV. Fill in the blanks with appropriate word

13. An intercalating dye used to detect nucleic acid when viewed under uv light is--------
14. The expansion of PUC vector is------
15. The function of Hup gene in rhizobium is-----
16. -------- is a cloning vector that can be used to clone large DNA fragments (> 1 MB)

SECTION-B

Answer any **four** of the following: (Each question carries a weightage of **1**)

17. Differentiate between plasmid and plastid
18. What is Southern blotting?
19. Explain cDNA library and DNA library
20. Mention the significance of Nif gene in crop improvement
21. Give the uses of Laminar air flow
22. Expand ELISA
23. How can you obtain virus-free sugarcane plants from virus-infected plants? Are these plants virus-resistant? Give reasons.
24. What are edible vaccines? Mention two advantages of developing edible vaccines.
25. Why is nutrient medium autoclaved before it is used for tissue culture? How will you sterilise hormones, justify.
26. What is a cDNA library? List two advantages of a cDNA library over a genomic library.
27. Give a brief account of biosensors
28. How does a doctor utilise nanobiotechnology to treat cancer?

SECTION – C

Answer any ***Five***

(Short essay- type questions; each question carries a weightage of 2)

29. How can you obtain virus-free sugarcane plants from virus-infected plants? Are these plants virus-resistant? Give reasons.
30. What are edible vaccines? Mention two advantages of developing edible vaccines.
31. Why is nutrient medium autoclaved before it is used for tissue culture? How will you sterilise hormones, justify.

32. Explain the genetics of nitrogen fixation.Give a brief account of regulation of nif gene expression.

33. What are the basic steps of a polymerase chain reaction (PCR)? Write two applications of PCR.

34. Ramu developed somatic embryos from tobacco culture and he wished to send it across to his friend abroad.

    a. What technique can be used to transport these without damage?

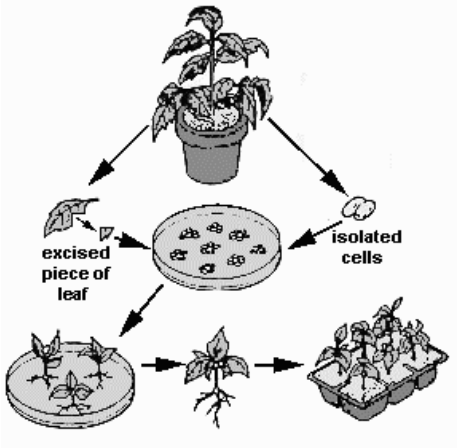
    b. Briefly describe the procedure

35. What are the different types of restriction enzymes? What is common in the recognition sequence of all organisms which is recognised by restriction enzymes? Explain with an example.

36. A scientist wishes to prevent unauthorised copying of his invention. Mention the rules and regulations that you have studied to protect his rights.

SECTION – D

Answer any **two** questions (Each carries a weightage of **4**)



37. a. Comment on the process shown in the figure

    b. Briefly describe any two sterilization process employed

    c. Give a brief account of general composition of culture medium

38. Naveena tried to develop a potato plant resistant to ring rot. She cloned the gene for resistance from a wild potato variety. Briefly describe various techniques available for introducing this gene into potato plant

39. Several persons of a village, using water from a river were affected by a new disease. A scientist trying to identify the organism has to develop microbial cultures. Describe the different methods, media and their composition

UNIVERSITY OF KERALA
B.Sc. Botany- Practical- Model Question Paper
BOTANY (Core Practical-I)

Methodology and Perspectives of Sciences, Methodology of Plant Science
Angiosperm Anatomy, Reproductive Botany and Palynology

Course Code: BO1442
Time: 3 Hours **Max. Weightage= 30**

1. Prepare the frequency table from the given data **A.** Find out the maximum frequency class and the minimum frequency class **(Weightage- 1+1= 2)**

2. Analyse the data **B** using frequency table and histogram
Or
Graph the data using line graph or Bar diagram
(Diagram-1; Interpretation-1) **(Weightage -2)**

3. Comment on the aim and working of the instrument **C**
(Aim – 0.5; Working-0.5) **(Weightage -1)**

4. Measure the size of the given material **D** using Micrometer
(Skill – 1; Calculation 0.5; Final result-0.5) **(Weightage -2)**

5. Comment on the material **E** given
(Major group –0.5; Composition 0.5; Use-1) **(Weightage -2)**

6. Adjust the pH of the given solution **F**
(Procedure –1; Result-1) **(Weightage -2)**

7. Describe the exine ornamentation and aperture type of the given pollen grain **G**
(Ornamentation type–1; Aperture type-1) **(Weightage -2)**

8. Work out the problem **H**
(Calculation- 1; Result-1) **(Weightage -2)**

9. Make suitable micro preparations to bring out the structure of **I** . Draw a cellular diagram and label the parts. Identify giving reasons and leave the preparation for evaluation.
(Preparation – 2; Labelled diagram-2; Identification-1; Reasons-1) **(Weightage -6)**

10. Identify the stomatal type of **J**
(Identification-1; Diagram-1) **(Weightage -2)**

11. Identify the type of cellular inclusion in **K**
(Identification-1; Description-0.5; Diagram-0.5) **(Weightage -2)**

12. Identify the type of embryo **L**
(Identification-1; Diagram-1) **(Weightage -2)**

13. Record
(Content-2; Neatness-1) **(Weightage -3)**

KEY TO THE SPECIMENS

A. Statistical data

B. Biostatistics

C. pH meter, Colorimeter, Centrifuge etc.

D. Spirogyra filament or pollen grains

E. Fixative, stain, mounting agent etc. mentioned in the syllabus

F. Any solution of known pH

G. Pollen grain of any angiosperm

H. Mean, median or mode

I.Secondary structure of root or stem; Anomalous secondary thickening in the stem mentioned in the syllabus

J. Any type of stomata mentioned in the syllabus

K. Raphide, cystolith, starch grain etc. mentioned in the syllabus

L. Embryo types mentioned in the syllabus

UNIVERSITY OF KERALA
B.Sc. Botany- Practical- Model Question Paper
BOTANY (Core Practical-II)

Microbiology, Phycology, Mycology, Lichenology, Plant Pathology, Bryology, Pteridology, Gymnosperms and Paleobotany.

Course Code: BO1544
Time: 3 Hours **Max. Weightage= 30**

1. Make suitable micro preparations to bring out the structure of **A, B, C&D**. Draw a cellular diagram of each and label the parts. Identify giving reasons and leave the preparation for evaluation.
(Preparation-1, identification with reasons-1, labeled diagram-1) (Weightage- 3x4= 12)

2. Sort out and identify any two algal specimens from the mixture **E**
(Separation & preparation-0.5; identification with reasons-1) (Weightage-1.5x2 = 3)

3. Perform the Gram staining of bacterial solution **F** and show the result. Write the procedure
(Procedure-1; Skill- 1; Result- 1) (Weightage -3)

4. Identify the disease, name of pathogen and give important symptoms of **G)**
(Disease-0.5; Pathogen-1; Symptoms-1.5) (weightage-3)

5. Spot at sight **H I, J, K, L &M** **(weightage 1x6=6)**
6. **Record**
(Content-2; Neatness-1) (Weightage -3)

KEY TO THE SPECIMENS

A. Fungus mentioned in the syllabus

B. Bryophyte mentioned in the syllabus

C. Pteridophyte mentioned in the syllabus

D. Gymnosperm mentioned in the syllabus

E. Algal mixture (Mixture of different algae prescribed in the syllabus, containing at least four members

F. Bacterial solution

G. Plant disease mentioned in the syllabus

H. Alga

I. Fossil form in Paleobotany

J. Lichen

K. Bryophyte

L. Pteridophyte

M. Gymnosperm.

Pattern of questions

Quest.No	Topics	Weightage
1	Mycology, Bryology, Pteridology and Gymnosperm	12 (3 each)
2	Phycology	3
3	Microbiology	3
4	Plant Pathology	3
5	Phycology, , Lichenology, Bryology, Pteridology and Gymnosperm&Paleobotany	6 (1 each)
6	Record	3
	Total	30

UNIVERSITY OF KERALA
B.Sc. Botany- Practical- Model Question Paper
BOTANY (Core Practical-III)

Plant Physiology, Biochemistry, Angiosperm Morphology, Systematic botany, Economic Botany, Ethno botany and Pharmacognosy

Course Code: BO 1644
Time: 3 Hours **Max. Weightage= 30**

1. Prepare a standard graph and estimate colorimetrically the quantity of protein/total sugar /reducing sugar from the given sample **A** and write down the principle and procedure
(Estimation-2;Principle-0.5;Procedure-0.5) **(weightage-3)**

2. Determine the presence of Protein/reducing sugar/amino acid/sucrose/starch/-- in the given sample **B** by conducting appropriate test. Write down the principle and procedure

(Procedure-1;Skill-1; General test-0.5; Confirmatory test-0.5) **(weightage -3)**

3. Set up the physiology experiment using the materials supplied **C** and explain its principle and working

(Explanation-1;ExperimentalSetup-1) **(weightage-2)**

4. Describe the given specimen **D** in technical terms. Classify the specimen to its respective family giving reasons. Give a floral diagram and floral formula Draw labelled diagram of the L.S. of flower
(Technical description of Vegetative Characters- 1; Technical description of Floral Characters- 2; Identification of the family- 0.5 ;Reasons- 0. 5; Floral Formula- 0.5; Floral diagram -0.5;Labelled diagram of L.S of the flower-1)

(weightage-6)

5. Identify, classify and describe the vegetative and floral characters of specimen **E** giving reasons
(Identification-0.5;Description-1;Reasons-0.5) **(weightage- 2)**

6. Write the botanical name and family of the given specimens **F & G**
(Binomial -0.5, family- 0.5) **(weightage 1 x 2 = 2)**

7. Identify and write notes on **H** **(weightage -1)**

8. Give the binomial, family and exact morphology of useful part of **I**, **J, K** and **L**
(Binomial-0.5; Family-0.5; Morphology-0.5) **(weightage-1.5x4=6)**

9. Spot at sight **M** and **N** **(weightage 1x2=2)**

10. Record
(Content-2; Neatness-1) **(Weightage -3)**

KEY TO THE SPECIMENS

A. Carbohydrate\ Protein; BSA

B. Reducing or non reducing sugar\ starch\ protein

C. Physiology experiment

D. Plant/ twig with flowers and buds from any dicot families as per syllabus

E. Plant/ twig with flowers from any family

F. Herbarium sheet
G. Herbarium sheet

H. Fruit/ inflorescence/ Leaf type/ Placentation

I. Economic botany

J. Economic botany
K. Ethnobotany
L. Ethnobotany
M. Pharmacognosy
N. Pharmacognosy

Scheme of questions

Quest.No.	Subject	Weightage
1	**Biochemistry**	3
2	**Biochemistry**	3
3	**Plant Physiology**	2
4	**Systematic botany**	6
5	**Systematic botany**	2
6	**Systematic botany**	2
7	**Angiosperm Morphology**	1
8	**Economic Botany, Ethnobotany**	3+3
9	**Pharmacognosy**	2
10	**Record**	3
	Total	**30**

UNIVERSITY OF KERALA
B.Sc. Botany- Practical- Model Question Paper
BOTANY (Core Practical-IV)
Cell Biology, Genetics, Plant Breeding, Evolutionary Biology, Environmental Studies and Phytogeography

Course Code: BO 1645
Time: 3 Hours **Max. Weightage= 30**

1. Prepare an acetocarmine squash of **A** and identify two clear stages of mitotic division with reasons, draw a labeled diagram of each stage and report for evaluation.
(**Preparation -1; stages-1; labeled diagrams -1; reasons-1)** **(weightage- 4)**

2. Work out the problems **B** and **C** **(weightage-5+3=8)**

3. Identify and write notes on **D** & **E**

(Identification-1; description-1) **(weightage-2+2= 4)**

4. Take a T.S. of material **F** & **G** and identify the ecological group and comment on its adaptations
(Ecological group-1; adaptations-1.5) **(weightage-2.5+2.5 = 5)**

5. Calculate the abundance, density and frequency of each species in the given quadrate table **H**
(Abundance-1; Density-1; Frequency-1) **(weightage-3)**

6. Comment on **I** & **J** **(weightage- 1.5+1.5=3)**

7. Record
(Content-2; Neatness-1) **(Weightage -3)**

KEY TO THE SPECIMENS

A. Onion root tip
B. Dihybrid / non-allelic gene interaction
C. Molecular genetics
D. Budding/grafting/layering (Original specimen / photograph)
E. Anything related to evolution (Photograph only)
F. Ecological specimen mentioned in the syllabus
G. Ecological specimen mentioned in the syllabus
H. Quadrate Table consisting of 3 species
I. Polytene / lamp brush chromosomes/ Cell organelles etc. (Photograph only)
J. Pioneer workers in genetics/sex chromosomal abnormalities etc. (photographs only)

Scheme of questions

Quest.No	Subject	Weightage
1	**Cell Biology**	4
2	**Genetics**	8
3	**Plant Breeding and Evolutionary Biology**	4
4	**Environmental studies**	5
5	**Environmental studies**	3
6	**Cell Biology & Genetics**	3
7	**Record**	3
	Total	30