B.Sc. PLANT SCIENCE

REGULATIONS AND SYLLABIS
(Effective from 2010-2011)
Aim of the Course:

The Degree of Bachelor of Science in Plant Science aims to introduce the students to various aspects of plant biology. At the end of the course, the students are expected to have good working knowledge in the field of Plant Science.

Eligibility for Admission:

Candidates for admission to B.Sc. Plant Science shall be required to have passed H.Sc. or 10+2 or equivalent course conducted by the Government of Tamil Nadu / Andhra Pradesh/ Kerala/ CBSE with Biology as one of the subjects of study or an examination accepted as equivalent thereto and 35 percentage of marks in Part III (aggregate / Part – III), subject to such conditions as may be prescribed therefore.

Lateral Entry (if applicable)

Candidates who have passed Diploma in ______________ in First Class (10+3 years of Study) are eligible to apply for the lateral entry to the 2nd year of the course subject to availability of seats, but limited to 10% of the sanctioned intake.

Duration of the course:

The Course shall be of three years duration spread over Six semesters. The maximum duration to complete the course shall be Six years (including completion of arrears, if any).

Eligibility for admission to Examination:

Seventy five (75) percentage of attendance for theory
Seventy five(75) percentage of attendance for Practicals
(i.e., % attendance required prescribed if any)

Medium:

The medium of instruction shall be English

Passing Minimum:

Passing eligibility & classification for the award of the Degree is as follows: Passing Minimum – 40%; III Class – 40 to 50%; II Class – 50 to 60%; I Class – 60 to 75%; Distinction – above 75%
PONDICHERRY UNIVERSITY  
B.Sc. PLANT SCIENCE (MAIN AND ALLIED) – SEMESTER SYSTEM  
Details of papers and scheme of examination (Effective from the academic year 2010-11)

<table>
<thead>
<tr>
<th>I B.Sc.</th>
<th>Duration of Exam</th>
<th>Maximum Marks</th>
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<tbody>
<tr>
<td>FIRST SEMESTER</td>
<td></td>
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</tr>
<tr>
<td>Paper-I Algology &amp; Lichenology</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Paper-II Mycology &amp; Phytopathology</td>
<td>3 Hrs</td>
<td>100</td>
</tr>
<tr>
<td>Practical-I (Covering Papers I &amp; II)</td>
<td>3 Hrs</td>
<td>40</td>
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<tr>
<td>SECOND SEMESTER</td>
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<tr>
<td>Paper-III Bryology &amp; Pterodology</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Paper-IV Gymnosperms &amp; Palaeobotany</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Practical-II (Covering Papers III &amp; IV)</td>
<td>3 Hrs</td>
<td>40</td>
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<td>II B.Sc.</td>
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<tr>
<td>THIRD SEMESTER</td>
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<tr>
<td>Paper-V Anatomy of Angiosperms</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Paper-VI Development and Reproduction in Flowering Plants</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Practical-III (Covering Papers V &amp; VI)</td>
<td>3 Hrs</td>
<td>40</td>
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<tr>
<td>FOURTH SEMESTER</td>
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<tr>
<td>Paper-VII Diversity of Angiosperms and their Systematics</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Paper-VIII Cell Biology</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Practical-IV (Covering Papers VII &amp; VIII)</td>
<td>3 Hrs</td>
<td>40</td>
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<tr>
<td>III B.Sc.</td>
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<td>FIFTH SEMESTER</td>
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<tr>
<td>Paper-IX Plant Physiology</td>
<td>3 Hrs</td>
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<tr>
<td>Paper-X Plant Biochemistry and Biophysics</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Paper-XI Ecology and Utilization of Plants</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Paper-XII Genetics and Plant Breeding</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Paper-XIII Biostatistics and Computer Applications in Biology</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Practical-V (Covering Papers IX, X, XI, XII, XIII)</td>
<td>3 Hrs</td>
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<tr>
<td>SIXTH SEMESTER</td>
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<tr>
<td>Paper-XIV Microbiology</td>
<td>3 Hrs</td>
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<td>Paper-XV Molecular Biology</td>
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<td>100</td>
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<td>Paper-XVI Plant Biotechnology</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Paper-XVII Medical Botany</td>
<td>3 Hrs</td>
<td>100</td>
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<tr>
<td>Paper-XVIII Group Project* OR</td>
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<tr>
<td>Paper-XVIII Special paper (Optional)</td>
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<tr>
<td>a. Marine Botany</td>
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<td>OR</td>
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<tr>
<td>b. Biodiversity and Conservation</td>
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<tr>
<td>Project report 75 + Viva voce 25</td>
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<td>100</td>
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<tr>
<td>3Hrs</td>
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<td>100</td>
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<tr>
<td>Practical-VI (Covering Papers XIV, XV, XVI, XVII &amp; XVIII). In case group project is opted</td>
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<tr>
<td>Practical VI covers papers XIV, XV, XVI &amp; XVII</td>
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<tr>
<td>3 Hrs</td>
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<td>70</td>
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*Project to be valued by both examiners (internal and examiner)

ALLIED PLANT SCIENCE FOR ZOOLOGY MAIN/CHEMISTRY MAIN
Effective from the academic year 2010-11

<table>
<thead>
<tr>
<th>FIRST SEMESTER</th>
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<tbody>
<tr>
<td>Allied Plant Science – I</td>
<td>3 Hrs</td>
<td>75</td>
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<tr>
<td>Allied Plant Science Practical – I (Covering Allied plant Science Paper-I)</td>
<td>2 Hrs</td>
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<tr>
<th>SECOND SEMESTER</th>
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<tbody>
<tr>
<td>Allied Plant Science – II</td>
<td>3 Hrs</td>
<td>75</td>
</tr>
<tr>
<td>Allied Plant Science Practical – II (Covering Allied plant Science Paper-II)</td>
<td>2 Hrs</td>
<td>25</td>
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</table>
Course Objectives:

- To learn about the morphology of algae and lichens.
- To understand the diversity, complexity and the economic value of algae and lichens.

Theory:

Unit I: 9 Hrs


Unit II: 7 Hrs.

Unit III: 7 Hrs.


Unit IV: 6 Hrs.

Unit V: 7 Hrs.
Practicals:

1. Study of microscopic blue-green alga – *Nostoc* and Heterocyst – micropreparation.
5. Study of morphology of Rhodophyceae - *Polysiphonia*: Gametophyte, Sporophyte and Cystocarp
6. Study of external morphology of *Parmelia* and *Usnea*
7. L. S. of Lichen Apothecium.

Text books:

Course Objectives:
- To understand the diversity, complexity and the economic value of fungi.
- To learn the etiology, symptoms and transmission of some plant diseases.

Theory

Unit I: 8Hrs

Unit II: 8Hrs

Unit III: 9Hrs

Unit IV: 6Hrs

Unit V: 6Hrs
Diseases:- symptoms, causative organism, disease cycle and control of following diseases

a] Phytophthora infestans (Late blight of Potato)
b] Pythium debaryanum (damping off disease)
c] Helminthosporium oryzae (Leaf spot disease of rice)
d] Puccinia graminis var. tritici (Black rust)
Practicals:

1. Identification and micropreparation of *Plasmodiophora, Mucor* and *Saccharomyces*
2. Identification and micropreparation of *Peziza, Agaricus* and *Colletotrichum*
3. Study of diseased plant materials

Text books:

Course Objectives:
- To understand the diversity and complexity of amphibians of plant kingdom.
- To learn about the vascular cryptogams.

Theory
Unit-I 8Hrs
General Classification of Bryophytes based on Rothmaler [In brief, general characters at class level only] - Resemblances of bryophytes with Thallophytes (algae) - Differences between Thallophytes and Bryophytes - Marchantia - Occurrence -external features of adult gametophyte - Internal structure - Reproduction - Asexual reproduction - structure of Gemma - Sexual reproduction - structure of Antheridiophore and Archegoniophore - Sporophyte structure - Life history. (Need not study the development of sex organs)

Unit-II 9Hrs


Unit-III 7Hrs
Outline classification of Pteridophytes by G.M. Smith [In brief, general characters at class level only] - Resemblances with Bryophytes- Psilotum - external features of sporophytes - internal features of aerial stem and Synangium - morphological nature of sporangium-bearing structures. Lycopodium -Occurrence - External features of the adult sporophyte, internal features, Steles of various species - Life cycle - vegetative reproduction, asexual method, strobilus, sporangia- gametophytes of different species - mature antheridium and archegonium - morphological nature of the Protocorm - Life cycle.

Unit-IV 6Hrs
Unit-V  

Practicals:
1. Study of external and internal structure of Marchantia, Anthoceros and Funaria.
2. Study of the external and internal structure of Psilotum and Lycopodium stem and structure of cone
3. Study of the external and internal structure of Equisetum stem and structure of cone
4. Study of the external and internal structure of Marsilea rhizome and petiole

Text books:
PAPER – IV GYMNOSPERMS AND PALAEOBOTANY

Course Objectives:
- To understand the diversity of gymnosperms
- To learn the preserved vestiges of plant life of the geological past.

Theory:

Unit-I 9Hrs

Unit-II 8Hrs

Unit-III 7Hrs
*Ephedra* - external features of the adult sporophyte – internal features of young stem and old stem - Reproduction – male flowers, microsporangia – female strobilus, female flowers, megasporangia, male gametophyte – female gametophyte – young sporophyte – structure of seed - life cycle - economic importance. (Need not study the developmental stages of the sex organs)

Unit-IV 6Hrs
General account of fossils and fossilization – factors and theories of preservation – kinds of preservation: Compressions, coal balls, impressions, incrustations (Casts), petrifactions (mineralized plants), compactions (Mummified plants), ambers. Geological time scale, computation of age of fossils (radio carbon dating).

Unit-V 5Hrs
A detailed study of external, internal morphology and reproduction in the following fossils – *Rhynia, Lepidodendron* and *Williamsonia*
Practicals:

1. Study of the internal structure of the leaflet of Cycas
2. Study of the internal structure of Pinus stem and needle leaf
3. Study of the Pinus male and female cone
4. Study of male and female flowers of Ephedra
5. Study of the structure of Rhynia, Lepidodendron, Williamsonia and Sewardiana with the help of fossils.

Text books:

BLUE PRINT OF QUESTION PAPER FOR B.Sc. PLANT SCIENCE MAIN
(Effective from the academic year 2010-11)

Time – 3 hrs
Max. Marks – 100

Section – A
Answer all the questions. Each answer should not exceed 30 words.
Two questions from each unit (10 x 2 = 20 marks)
1. Unit I
2. Unit I
3. Unit II
4. Unit II
5. Unit III
6. Unit III
7. Unit IV
8. Unit IV
9. Unit V
10. Unit V

Section – B
Answer any eight questions. Each answer should not exceed 200 words.
Two questions from each unit (8 x 5 = 40 marks)
11. Unit I
12. Unit I
13. Unit II
14. Unit II
15. Unit III
16. Unit III
17. Unit IV
18. Unit IV
19. Unit V
20. Unit V

Section – C
Answer any four questions. Each answer should not exceed 600 words.
One question from each unit (10 x 4 = 40 marks)
21. Unit I
22. Unit II
23. Unit III
24. Unit IV
25. Unit V
PONDICHERRY UNIVERSITY
BLUE PRINT OF PRACTICAL QUESTION PAPER
FOR B.Sc. PLANT SCIENCE MAIN
(Effective from the academic year 2010-11)

Practical Paper – 1 (Algology, Lichenology, Mycology & Phytopathology)

Time – 3 Hrs.                       Max Marks – 40.

1. Make suitable micro preparations of A, B & C. Leave the slide for valuation. Identify with reasons.
   (Preparation-2, Identification-1, Reasons-2 marks)                  (3x5=15 Marks)

2. Draw labeled sketches and identify giving reasons D, E & F.
   (Identification-1, Diagram-1, Reasons-2marks)                      (4x3=12 Marks)

3. Identify G giving reasons.                                             (1x3=03 Marks)

Total for Practical = 30 Marks.
Record Marks        = 10 Marks.
Total                = 40 Marks.

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<tbody>
<tr>
<td>A</td>
<td>Alga</td>
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<td>B</td>
<td>Fungus</td>
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<td>C</td>
<td>Phytopathology</td>
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<tr>
<td>D</td>
<td>Alga</td>
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<td>E</td>
<td>Fungus</td>
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<td>F</td>
<td>Phytopathology</td>
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<tr>
<td>G</td>
<td>Lichens</td>
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PONDICHERRY UNIVERSITY
BLUE PRINT OF PRACTICAL QUESTION PAPER
FOR B.Sc. PLANT SCIENCE MAIN
(Effective from the academic year 2010-11)

Practical Paper – 11 (Bryology, Pteridology, Gymnosperms & Paleobotany)

Time – 3 Hrs.                      Max Marks – 40.

1. Make suitable micro preparations of A, B & C. Leave the slide for valuation. Identify with reasons.
   (Preparation-2, Identification-1, Reasons-2 marks)  (3x5=15 Marks)

2. Draw labeled sketches and identify giving reasons D, E & F.
   (Identification-1, Diagram-1, Reasons-2marks)  (4x3=12 Marks)

3. Identify G giving reasons.  
   (1x3=03 Marks)

Total for Practical = 30 Marks.
Record Marks = 10 Marks.
Total = 40 Marks.

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<tbody>
<tr>
<td>A</td>
<td>Bryophyte (Section)</td>
</tr>
<tr>
<td>B</td>
<td>Pteridophyte (Section)</td>
</tr>
<tr>
<td>C</td>
<td>Gymnosperm (Section)</td>
</tr>
<tr>
<td>D</td>
<td>Bryophyte (Slide/Specimen)</td>
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<tr>
<td>E</td>
<td>Pteridophyte (Slide/Specimen)</td>
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<tr>
<td>F</td>
<td>Gymnosperm Slide/Specimen</td>
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<tr>
<td>G</td>
<td>Paleobotany (Slide/Specimen)</td>
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</table>
Theory:

Unit I
General characters of bacteria and study of structure and reproduction of Escherichia coli and Xanthomonas.

Unit II
General characters of Fungi and study of structure and reproduction of Aspergillus and Puccinia.

Unit III
Classification of Plant Kingdom: Study of major divisions – structure, reproduction and life cycle of the following genera: Oedogonium, Marchantia, Selaginella and Pinus.

Unit IV
Taxonomy: Study of Angiospermic families (Bentham and Hooker): Annonaceae, Cucurbitaceae, Apocynaceae, Euphorbiaceae and Poaceae.

Unit V
Binomial, family and morphology of the useful parts of any three products under each of the following categories: Cereals, Millets, Pulses, Oils, Spices, Beverages and Medicines.

Practicals:
1. Study of genera included in Unit I, II and III.
2. Study of families included in Unit IV.
3. Study of products of economic importance included in Unit V.

Text books:
Theory:

Unit I
Study of plant cell organelles with emphasis on cell wall, chloroplast and sphaerosome.

Unit II
Anatomy of primary and secondary structure in stem and root of dicot, anatomy of dicot and monocot leaf.

Unit III
Brief study of mechanism of ion transport, nitrogen fixation by symbiotic bacteria, photosynthesis, respiration and phytohormones.

Unit IV
Applied Microbiology: Agricultural microbiology (soil microflora, soil fertility and biofertilizers); Industrial microbiology (fermentation, alcoholic beverages, beers and vine); Food microbiology (microbial spoilage of food, microbial contamination of milk and water)

Unit V
Plant Ecology: Brief study of ecosystems, plants as primary producers, food chain and food web, ecological pyramids. Forests their importance and conservation, urban and rural forestry. Pollution: plants as pollution indicators and pollution controlling agents.

Practicals:
1. Study of Cell Organelles include in Unit I from electron micrographs.
2. Anatomical studies of plant parts included in Unit II.
3. To perform simple experiments as included in Unit III.
4. Study of microbes as included in Unit IV.
5. Study of ecological processes included in Unit V.

Text books:
**PONDICHERRY UNIVERSITY**

**BLUE PRINT OF QUESTION PAPER FOR ALLIED PLANT SCIENCE FOR B.Sc., ZOOLOGY MAIN**

(Effective from the academic year 2010-11)

Time – 3 hrs

Max. Marks – 75

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**Section – A**

Answer all the questions. Each answer should not exceed 50 words.

Two questions from each unit (10 x 2 = 20 marks)

1. Unit I
2. Unit I
3. Unit II
4. Unit II
5. Unit III
6. Unit III
7. Unit IV
8. Unit IV
9. Unit V
10. Unit V

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**Section – B**

Answer all the questions. Each answer should not exceed 200 words.

Two questions from each unit (5 x 5 = 25 marks)

11 a) Unit I
11 b) Unit I
12 a) Unit II
12 b) Unit II
13 a) Unit III
13 b) Unit III
14 a) Unit IV
14 b) Unit IV
15 a) Unit V
15 b) Unit V

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**Section – C**

Answer any three questions. Each answer should not exceed 600 words.

One question from each unit (10 x 3 = 30 marks)

16. Unit I
17. Unit II
18. Unit III
19. Unit IV
20. Unit V
PONDICHERRY UNIVERSITY
BLUE PRINT OF QUESTION PAPER FOR
ALLIED PLANT SCIENCE PRACTICAL FOR B.Sc., ZOOLOGY MAIN
(Effective from the academic year 2010-11)

Allied Zoology practical paper – 1.


1. Identify, draw and write notes on A, B & C.
   (Identification – 1, Diagram – 1, Notes – 2)  \(3\times4 = 12\)

2. Assign the given specimen D to its family. Describe in technical terms and draw diagrams.
   (Family – 1, Technical description – 2, Diagram – 1) \(1\times4 = 04\)

3. Identify the binomial, family & morphology of the useful part of E.
   (Binomial – 1, Family – 1, Useful part – 2) \(1\times4 = 04\)

Total for Practical = 20.
Record = 05.
Total = 25.

KEY

<table>
<thead>
<tr>
<th>A</th>
<th>Bacteria</th>
<th>(Slide/Specimen)</th>
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<tbody>
<tr>
<td>B</td>
<td>Algae/Fungus.</td>
<td>(Slide/Specimen)</td>
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<tr>
<td>C</td>
<td>Bryophyte/Pteridophyte/Gymnosperm.)</td>
<td>(Slide/Specimen)</td>
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<tr>
<td>D</td>
<td>Taxonomy.</td>
<td>(Specimen)</td>
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<tr>
<td>E</td>
<td>Economic Botany</td>
<td>(Product/Specimen)</td>
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</tbody>
</table>
Allied Zoology Practical paper – 11.


1. Identify, draw and write notes on A & B.
   (Identification – 1, Diagram – 1, Notes – 2)  
   \[(2 \times 4 = 08)\]

2. Comment on the physiological importance of C.
   (Notes – 2, Diagram – 2)  
   \[(1 \times 4 = 04)\]

3. Comment on the microbiological importance of D.
   (Notes – 2, Diagram – 2)  
   \[(1 \times 4 = 04)\]

4. Comment on the ecological importance of E.
   (Notes – 2, Diagram – 2)  
   \[(1 \times 4 = 04)\]

Total for Practical = 20.
Record = 05.
Total = 25.

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<tbody>
<tr>
<td>A</td>
<td>Cell Biology</td>
<td>(Slide/Photograph)</td>
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<td>B</td>
<td>Anatomy</td>
<td>(Slide/Specimen)</td>
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<td>C</td>
<td>Physiology</td>
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<td>D</td>
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<td>E</td>
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Thery:

Unit I
General characters of Bacteria and study of structure and reproduction of *Escherichia coli* and *Xanthomonas*.

Unit II
General characters of Fungi and study of structure and reproduction of *Aspergillus* and *Puccinia*.

Unit III
Classification of Plant Kingdom: study of major divisions – structure, reproduction and life cycle of the following genera: *Oedogonium, Marchantia, Selaginella* and *Pinus*.

Unit IV
Taxonomy: Study of Angiospermic families (Bentham and Hooker): Annonaceae, Cucurbitaceae, Apocynaceae, Euphorbiaceae and Poaceae.

Unit V

Practcials:

1. Study of genera included in Unit I,II and III.
2. Study of families included in Unit IV.
3. Study of products of economic importance included in Unit V.

Text books:

PONDICHERRY UNIVERSITY
Allied Plant Science for B.Sc.,Chemistry Main – Paper - II
(Effective from the academic year 2010-11)

Theory:

Unit I
Study of plant cell organelles with emphasis on cell wall, chloroplast and sphaerosome.

Unit II
Brief study of structure of DNA and RNA; bacterial plasmid DNA; recombinant DNA technology and gene cloning.

Unit III
Brief study of mechanism of ion transport, nitrogen fixation by symbiotic bacteria, photosynthesis, respiration and phytohormones.

Unit IV
Applied Microbiology: Agricultural microbiology (soil microflora, soil fertility and biofertilizers); Industrial microbiology (fermentation, alcoholic beverages, beers and vine); Food microbiology (microbial spoilage of food, microbial contamination of milk and water)

Unit V
Biochemical techniques: Chromatography (Paper and Thin layer); spectrophotometry; tracer techniques.

Practicals :

1.Study of Cell Organelles included in Unit I from electron micrographs.
2.Study of microbial structures as included in Unit II.
3.To perform simple experiments as included in Unit III,IV & V.

Text books :

PONDICHERRY UNIVERSITY
BLUE PRINT OF QUESTION PAPER FOR ALLIED PLANT SCIENCE FOR
B.Sc.,CHEMISTRY MAIN
(Effective from the academic year 2010-11)

Time – 3 hrs        Max. Marks – 75

Section – A
Answer all the questions. Each answer should not exceed 50 words.
Two questions from each unit        (10 x 2 = 20 marks)
1. Unit I
2. Unit I
3. Unit II
4. Unit II
5. Unit III
6. Unit III
7. Unit IV
8. Unit IV
9. Unit V
10. Unit V

Section – B
Answer all the questions. Each answer should not exceed 200 words.
Two questions from each unit        (5 x 5 = 25 marks)
11 a) Unit I
11 b) Unit I
12 a) Unit II
12 b) Unit II
13 a) Unit III
13 b) Unit III
14 a) Unit IV
14 b) Unit IV
15 a) Unit V
15 b) Unit V

Section – C
Answer any three questions. Each answer should not exceed 600 words.
One question from each unit        (10 x 3 = 30 marks)
16. Unit I
17. Unit II
18. Unit III
19. Unit IV
20. Unit V
Allied Chemistry Practical paper – 1.

Time : 2 Hrs.  
Max. Marks :25.

3. Identify, draw and write notes on A,B & C. 
   (Identification – 1,Diagram – 1,Notes – 2)  
   \(3\times4 = 12\)

4. Assign the given specimen D to its family. Describe in technical 
   terms and draw diagrams. 
   (Family – 1,Technical description – 2,Diagram – 1)  
   \(1\times4 = 04\)

6. Identify the binomial, family & morphology of the useful part of E. 
   (Binomial – 1,Family – 1,Useful part – 2)  
   \(1\times4 = 04\)

Total for Practical = 20.
Record = 05.
Total = 25.

**KEY**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>A</td>
<td>Bacteria</td>
</tr>
<tr>
<td>B</td>
<td>Algae/Fungus.</td>
</tr>
<tr>
<td>C</td>
<td>Bryophyte/Pteridophyte/Gymnosperms</td>
</tr>
<tr>
<td>D</td>
<td>Taxonomy.</td>
</tr>
<tr>
<td>E</td>
<td>Economic Botany</td>
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</table>
PONDICHERRY UNIVERSITY
BLUE PRINT OF QUESTION PAPER FOR
ALLIED PLANT SCIENCE PRACTICAL FOR B.Sc., CHEMISTRY MAIN
(Effective from the academic year 2010-11)

Allied chemistry Practical paper – 11.


1. Identify, draw and write notes on A & B.
   (Identification – 1,Diagram – 1,Notes – 2)          (2x4 = 08)

3. Comment on the physiological importance of C.
   (Notes – 2,Diagram – 2)                              (1x4 = 04)

3. Comment on the microbiological importance of D.
   (Notes – 2,Diagram – 2)                              (1x4 = 04)

4. Comment on the biochemical importance of E.
   (Notes – 2,Diagram – 2)                              (1x4 = 04)

Total for Practical = 20.
Record             = 05.
Total              = 25.

KEY

<table>
<thead>
<tr>
<th>A</th>
<th>Cell Biology</th>
<th>(Slide/Photograph)</th>
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</thead>
<tbody>
<tr>
<td>B</td>
<td>Nucleic acids</td>
<td>(Photograph/Specimen)</td>
</tr>
<tr>
<td>C</td>
<td>Physiology</td>
<td>(Set up/Specimen)</td>
</tr>
<tr>
<td>D</td>
<td>Microbiology</td>
<td>(Specimen/Photograph)</td>
</tr>
<tr>
<td>E</td>
<td>Biochemical techniques</td>
<td>(Set up/Photograph)</td>
</tr>
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