HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY

NAAC A (3.02) State University

PATAN - 384 265

FACULTY OF SCIENCE

B.Sc. BOTANY

Semesters: III

SYLLABUS

Curriculum as per UGC Guideline

With Semester/CBCS/Grading Pattern

With effect from June - 2021 (and thereafter)

DATE: June, 2021 **TOTAL PAGE: 19**

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY

NAAC A (3.02) State University

PATAN - 384 265.

U.G. (B.Sc.) Programme

CBCS:: Semester :: Grading Pattern

With effect from: June - 2021

FACULTY OF SCIENCE

Subject: BOTANY

B. Sc. Semesters: III

Total Pages: 01 to 19

Submitted on
Date: /06/2021

SUMMARY OF THE PROGRAMME

Summary of the Programme	
✓ Syllabus duration	Semester pattern i.e., **Six** months
✓ *No. of core compulsory (CC) course*	***02*** *(in each semester)*
✓ *Credits per CC course*	*03*
✓ *Total credits for CC course*	***06****/Semester*
✓ *Theory lectures per CC course*	*03 /week*
✓ *Total Theory lectures for CC course*	*06 /week*
✓ No. of Practical courses per semester	**02**
✓ Practical lectures	03 /week/course/batch
✓ Total Practical lectures	06 /week/ batch
✓ Credits per Practical course	**1.5**
✓ Total Credits of Practical course	**03** /Semester
✓ No. of Practical course (in Uni. Exam.)	**02** /Semester
✓ No. of Elective Subjective (ES) course	**01** (in each semester)
✓ Credits for ES course	**02** (in each semester)
✓ Theory lectures per ES course	02/week
✓ No. of Elective Generic (EG) course	**01**
✓ Credits for EG course	**02**
✓ Theory lectures per EG course	02/week
✓ Examination (including Preparation)(weeks)	05
✓ No. of Days per week	06
✓ Weeks (days) available for Teaching	**15** (90)
✓ Duration of each lecture (minutes)	55
✓ No. of students/batch	**20** (on approval of AC and Exam. unit)

Under Choice **B**ased **C**redit **S**ystem-Semester-Grading System pattern

U G (B. Sc.) Programme in Botany

Semester - III

Salient Features:

- CBCS in UG programme in **Botany Semester III** shall be offered from the Academic year **June 2021**.
- Botany subject in the Universities/Affiliated Colleges shall offer undergraduate programme in Faculty of Science from the Academic year 2021-22.
- A student will have to get enrolled a **Core course** depending upon his/her requirement of a degree in the said discipline of study. A student will have a choice of selecting an **Elective** as well as **Foundation** courses from a pool of courses.
- Each course shall be assigned a specific number of **Credits**.
- A Core course is the course which should compulsorily be studied by a candidate as a Core requirement so as to get degree in a said discipline of study.
- There shall be **Two Core Compulsory** courses (Theory) each with **3 credits** in each semester and their practical's each with **1.5 credits**. Thus, a credit weight-age in **B.Sc.** programme for each semester core course shall be of **6 credits**. In short, **9** credits multiplied by **2** subjects equal to total of **18 credits**.
- In addition to the Core courses, a student will have to choose Elective as well as Foundation courses from a pool of courses.
- **Two** courses of **Elective**, one each from **Generic Elective** and Interdisciplinary / Multidisciplinary / **Subject centric electives** shall have to be offered. The credit weight-age for each Elective course shall be of **02 Credits**. Hence, a total credit weight-age for Elective courses shall be of **4 credits**.
- One **Foundation** (English Language L.L.) course shall have to be offered. The credit weight-age for Foundation course shall be of **02 credits**.
- Each course shall have a unique Course code. The Core courses, Elective courses and the Foundation courses shall be abbreviated respectively as **CC, PC, EG, ES and FC.**

1. Core Compulsory **CC**

   Practical Core (Core Elective) **PC**
2. Elective Generic **EG**

   Elective Subject **ES**
3. Foundation Compulsory **FC**

- Each Academic year shall consist of **two** semesters, each of **15weeks** of teaching equivalent to 90 working days. The Odd semester period shall be from **July to November** and the Even semester period shall be from **December to April**.
- The course with **4 credits** shall be of **60 hrs** (15 weeks x 4 credits) duration. The course with **3 credits shall** be of **45 hrs** (15 weeks x 3 credits) duration. The course with **2 credits** shall be of **30 hrs** (15 weeks x 2 credits) duration.
- **A general framework for Bachelor of Science (B.Sc.) programme shall be as follows:**

Semester wise credits						**Total credits of the Programme**
I	**II**	**III**	**IV**	**V**	**VI**	
24	24	24	24	24	24	**144**

- **The semester wise weight age of core, elective and foundation courses shall be as follows:**

Academic year	**Core compulsory Courses**	**Elective courses**	**Foundation courses**
Semester I & II	65-75%	15-20%	10-15%
Semester III & IV	65-75%	15-20%	10-15%
Semester V & VI	65-75%	15-20%	10-15%

- **Attendance:**

  The Attendance Rules as per the norms of Hemchandracharya North Gujarat University.

- **Medium of Instruction:**
- The Medium of Instruction shall be of **Gujarati** and/or **English medium**.
- Student is free to write answers either in **Gujarati** and/or **English** language.
- **Language of Question paper:**

  Question paper should be drawn in **Gujarati** language and its **English** version should be given.

- **Evaluation Methods:**

  Academic performance in various courses *i.e.* core, discipline electives, generic electives and skill enhancement courses are to be considered as parameters for assessing the achievement of students in botany. A number of appropriate assessment methods of

botany will be used to determine the extent to which students demonstrate desired learning outcomes. Following assessment methodology should be adopted;

1. The oral and written examinations (Scheduled and surprise tests).
2. Closed-book and open-book tests.
3. Problem-solving exercises.
4. Practical assignments and laboratory reports.
5. Observation of practical skills.
6. Individual and group project reports.
7. Efficient delivery using seminar presentations.
8. Viva voce interviews are majorly adopted assessment methods for this curriculum.
9. The computerized adaptive testing, literature surveys and evaluations, peers and self-assessment, outputs form individual and collaborative work are also other important approaches for assessment purposes.
10. A student shall be evaluated through Comprehensive Continuous Assessment (**CCA**)/ (**Internal Evaluation**) as well as the **End of Semester examination** (**External Evaluation**). The weight-age of CCA shall be 30%, whereas the weight-age of the Semester end examination shall be 70%. There will be **no internal evaluation in practical courses.**
11. In Semester assessment (**CCA**)/ (**Internal Evaluation**) is spread through the duration of the course and is to be done by the Teacher teaching the course. BoS of the subjects will decide various criteria and their weight-age for CCA. The assessment is to be done by various means including:
    - ✓ Written Tests
    - ✓ MCQs based Tests/Quiz
    - ✓ Presentations/Seminars
    - ✓ Project work/Field work
    - ✓ Group discussions/Group activities
    - ✓ Assignments, etc.
12. The distribution of **Internal Evaluation** is given as per criteria given below for **30** marks:

    Written Test… **20** marks,
    Assignments/MCQs/Very Short questions… **05** marks and Attendance and
    Regularity, Punctuality… **05** marks.

13. The **End of Semester examination** (**External Evaluation**) shall have an assessment based upon following perspective with respect to all the courses:
    a. Evaluation with respect to Knowledge
    b. Evaluation with respect to Understanding
    c. Evaluation with respect to Skill
    d. Evaluation with respect to Application
    e. Higher Order Thinking Skills
14. With respect to all the above components, there shall be following types of Questions from each unit of the course.
    a. MCQs/Fill in the blanks/ Match the pairs, etc
    b. Short answer questions
    c. Medium answer questions
    d. Long answer questions
    e. Examples/ Problems, etc.
15. The End of Semester Examination will be conducted by the University. A certified journal of the respective practical course **must be produced** at the time of practical examination by the student.
16. It will be compulsory for a candidate to obtain passing percentage in both Internal as well as External Evaluation. The passing marks for each course shall be **40%** as decided by concern Board of Studies in Botany.
17. Promotion, Re-Admission and Time for Completion of Course, Procedure for Awarding Grades, Provision for Appeal, etc. as decided by the Hemchandracharya North Gujarat University.

STUDY TOUR:

Botanical excursion/study tour may be arranged (by the concern faculty with prior permission of **HoD and/or Principal**) within state and/or outside the state to explore/study plant diversity in its natural habitats.

SUBMISSION:

Instead of submission of Herbarium sheets and/or specimens at the time of final (Uni.) practical examination student may submit photographs/ drawings/ charts/ models or CD having such photographs/drawings of plant species to conserve plant species in their natural habitats and to avoid any damage to plant species and its natural habitat.

ELECTIVE (SUBJECTIVE) COURSE:

For semester-III and IV a list of two courses is given below.

1. **Elective (Subject) Course :: ES BOT-301:: Plant Diversity and Human Welfare**
2. **Elective (Subject) Course :: ES BOT-401 :: Plant Breeding**

SELECTION OF ELECTIVE (GENERIC) COURSE:

- For semester-III and IV a separate consists of courses is offered by university. Students may select **any one** of them from offered courses in Semester-III and Semester-IV separately.

AIMS:

1. To transform curriculum into outcome-oriented scenario.
2. To develop the curriculum for fostering discovery-learning.
3. To equip the students in solving the practical problems pertinent to India.
4. To adopt recent pedagogical trends in education including e-learning, flipped class, hybrid learning and MOOCs.
5. To mold responsible citizen for nation-building and transforming the country towards the future.
6. To provide an environment that ensures cognitive development of students in a holistic manner. A dialogue about plants and its significance is fostered in this framework, rather than didactic monologues on mere theoretical aspects.
7. To provide the latest subject matter, both theoretical as well as practical, such a way to foster their core competency and discovery learning. A botany graduate as envisioned in this framework would be sufficiently competent in the field to undertake further discipline-specific studies, as well as to begin domain-related employment.
8. To mould a responsible citizen who is aware of most basic domain-independent knowledge, including critical thinking and communication.
9. To enable the graduate prepare for national as well as international competitive examinations, especially UGC-CSIR NET and UPSC Civil Services Examination.

SEM-III: CC-BOT-301: MYCOLOGY AND PHYTOPATHOLOGY

LEARNING OUTCOME:

On completion of this course, the students will be able to:

- Identify true fungi and demonstrate the principles and application of plant pathology in the control of plant disease.
- Demonstrate skills in laboratory, field and glasshouse work related to mycology and plant pathology.
- Develop an understanding of microbes, fungi and lichens and appreciate their adaptive strategies.
- Identify the common plant diseases according to geographical locations and device control measures.

SEM-III: CC-BOT-302: ARCHEGONIATE

LEARNING OUTCOME:

On completion of this course, the students will be able to:

- Demonstrate an understanding of archegoniatae, Bryophytes, Pteridophytes and Gymnosperms.
- Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.
- Understanding of plant evolution and their transition to land habitat.
- Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of Bryophytes, Pteridophytes, Gymnosperms.

ES-BOT-301: **Plant Diversity and Human Welfare**

LEARNING OUTCOME: On completion of the course, the students will be able to:

- Develop understanding of the concept and scope of plant biodiversity.
- Identify the causes and implications of loss of biodiversity.
- Apply skills to manage plant biodiversity.
- Utilize various strategies for the conservation of biodiversity.
- Conceptualize the role of plants in human welfare with special reference to India.

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN
B.Sc. Programme with 144 credits CBCS-Semester-Grading Pattern

w.e.f. June-2021

General Pattern/Scheme of study components along with credits for Science faculty.

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN						
B.Sc. three year (General) Programme with 144 credits Semester-III and IV in BOTANY w.e.f. June-2021						
General Pattern/Scheme of study components along with credits						
Study Components		**Ins. Hrs/ Week**	**Examination**			**Credit**
			Internal Marks	**Uni. Exam.** Marks	**Total** Marks	
Semester-III						
	Core Compulsory (CC) Course					
CC-I-3	Core Course-I (Paper-3)	3	30	70	100	**3**
CC-I-4	Core Course-I (Paper-4)	3	30	70	100	**3**
CC-II-3	Core Course-II (Paper-3)	3	30	70	100	**3**
CC-II-4	Core Course-II (Paper-4)	3	30	70	100	**3**
	Soft-skill: Practical Core (PC) Course					
PC-I-3	Practical Core Course-I (Paper-3)	3		50	50	**1.5**
PC-I-4	Practical Core Course-I (Paper-4)	3		50	50	**1.5**
PC-II-3	Practical Core Course-II (Paper-3)	3		50	50	**1.5**
PC-II-4	Practical Core Course-II (Paper-4)	3		50	50	**1.5**
	Foundation Course (FC)					
FG-21	Compulsory English (L.L.)	2	15	35	50	**2**
	Elective Course (EC)					
EG-21	Elective (Generic) Course	2	15	35	50	**2**
ES-21	Elective (Subject) Course	2	15	35	50	**2**
		30	**165**	**585**	**750**	**24**
Semester-IV						
	Core Compulsory (CC) Course					
CC-I-5	Core Course-I (Paper-5)	3	30	70	100	**3**
CC-I-6	Core Course-I (Paper-6)	3	30	70	100	**3**
CC-II-5	Core Course-II (Paper-5)	3	30	70	100	**3**
CC-II-6	Core Course-II (Paper-6)	3	30	70	100	**3**
	Soft-skill: Practical Core (PC) Course					
PC-I-3	Practical Core Course-I (Paper-5)	3		50	50	**1.5**
PC-I-4	Practical Core Course-I (Paper-6)	3		50	50	**1.5**
PC-II-3	Practical Core Course-II (Paper-5)	3		50	50	**1.5**
PC-II-4	Practical Core Course-II (Paper-6)	3		50	50	**1.5**
	Foundation Course (FC)					
FG-21	Compulsory English (L.L.)	2	15	35	50	**2**
	Elective Course (EC)					
EG-21	Elective (Generic) Course	2	15	35	50	**2**
ES-21	Elective (Subject) Course	2	15	35	50	**2**
		30	**165**	**585**	**750**	**24**

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B.Sc Programme (CBCS - Semester - Grading Pattern)

B. Sc.:: BOTANY :: SEMESTER END EXAMINATION

Format for Questions paper Core Compulsory Course in Botany

(B.Sc. Sem. – III)

(W.E.F. JUNE - 2021)

The university examination paper consists of four questions.

- First question is of 20 marks and will be from Unit – I.
- Second question is of 20 marks and will be from Unit – II.
- Third question is of 20 marks and will be from Unit – III.
- Fourth question is of 10 marks and will be from Unit – I TO IV.

Time: 2.5 Hrs **Total Marks: 70**

1. Long answered and medium answered/short note-typed questions from Unit-I 18
   a. Long answered questions (Attempt any **two** from **three** each of **5** marks)
   b. Medium answered or short note-typed questions (Attempt any **two** from **three** each of **4** marks)

2. Long answered and medium answered/short note-typed questions from Unit-II 17
   a. Long answered questions (Attempt any **two** from **three** each of **5**marks)
   b. Medium answered or short note-typed questions (Attempt any **two** from **three** , 4+3 marks)

3. Long answered and medium answered/short note-typed questions from Unit-III 18
   a. Long answered questions (Attempt any **two** from **three** each of **5** marks)
   b. Medium answered or short note-typed questions (Attempt any **two** from **three** , 4+3 marks)

4. a. Answer the following questions (any six out of eight) 12
   (Objective type short questions)
   b. Answer the following questions (any 5 out of seven) 05
   (MCQs)

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B.Sc. Programme (CBCS - Semester - Grading Pattern)

B. Sc.:: BOTANY :: SEMESTER END EXAMINATION

Format for Questions paper Elective Course in Botany

(B.Sc. Sem – III)

(W.E.F. JUNE - 2021)

The university examination paper consists of three questions.

- First question is of 12 marks and will be from Unit – I.
- Second question is of 12 marks and will be from Unit – II.
- Third question is of 11 marks and will be from Unit – I & II.

Time: 2 Hrs **Total Marks: 35**

Q.1 (a) Attempt any one out of two. **06 Marks**

(b) Attempt any two out of three. **06 Marks**

Q.2 (a) Attempt any one out of two. **06 Marks**

(b) Attempt any two out of three. **06 Marks**

Q.3 (a) Attempt any three out of five (SQ). **06 Marks**

(b) Attempt any five out of eight. **05 Marks**

B. Sc. Semester-III

Botany :: CC-BOT-301

Mycology and Phytopathology

(Credits: Theory-3, Practical-1.5)

Theory Lectures: 54

Unit 1: Fungi-1 (18 lectures)

- General characteristics; Affinities with plants. Thallus organization; Cell wall composition; Nutrition; Classification (Ainsworth).
- **Phycomycetes**: Zygomycetidae: Characteristic features. Thallus organisation; Reproduction; Life cycle and classification with reference to ***Rhizopus*.**
- **Ascomycetes**: General characteristics (asexual and sexual fruiting bodies); Life cycle and classification with reference to ***Claviceps*.**
- **Basidiomycetes**: General characteristics; Life cycle and Classification with reference to ***Agaricus***.

Unit 2: Fungi-2 (18 lectures)

- **Allied Fungi**: General characteristics; Status of Slime molds, Classification; Occurrence; Types of plasmodia; Types of fruiting bodies.
- **Lichens**: Occurrence; General characteristics; Classification; Study of thallus (morphological and anatomical), Reproduction; Economic importance.
- **Mycorrhiza**: Ectomycorrhiza, Endomycorrhiza and their significance.
- **Applied Mycology**: Application of fungi in food industry (Flavour & texture, Fermentation, Baking, Organic acids, Enzymes, Mycoproteins); Medicines (Pharmaceutical preparations); Agriculture (Bio fertilizers).

Unit 3: Phytopathology (18 lectures)

- Terms and concepts; General symptoms.
- Geographical distribution of diseases. Host-Pathogen relationships.
- Pathogen, Symptoms, Dissemination, Disease cycle and control measures of following plant diseases:
  - Bacterial diseases – **Citrus canker.**

- Fungal diseases – **White rust of crucifers.**

  Black rust of wheat.

B. Sc. Semester-III

Botany :: PC-BOT-301

Mycology and Phytopathology

Practicals:

1. ***Rhizopus***: study of asexual stage from temporary mounts and sexual structures through permanent slides/photographs/charts.
2. ***Claviceps***: study of asexual stage from temporary mounts. Study of Sexual stage from permanent slides/photographs/charts.
3. ***Agaricus***: Specimens of button stage and full grown mushroom; sectioning of gills of *Agaricus*. Permanent slides/photographs/charts.
4. ***Lichens***: Study of growth forms of lichens (crustose, foliose and fruticose) on different substrates. Study of thallus and reproductive structure (apothecium) through Permanent slides/photographs/charts/specimen.
5. **Mycorrhizae**: Ectomycorrhiza and Endomycorrhiza (Photographs).
6. **Phytopathology**: Study of Plant diseases: Citrus Canker, White rust of crucifers and Black rust of wheat.

Suggested Readings

1. Agrios, G.N. (1997) Plant Pathology, 4th edition, Academic Press, U.K.
2. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley & Sons (Asia) Singapore. 4th edition.
3. Webster, J. and Weber, R. (2007). Introduction to Fungi, Cambridge University Press, Cambridge. 3rd edition.
4. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi and Their Allies, Macmillan Publishers India Ltd.
5. Sharma, P.D. (2011). Plant Pathology, Rastogi Publication, Meerut, India.

B. Sc. Semester-III

Botany :: CC-BOT-302

Archegoniate

(Credits: Theory-3, Practical-1.5)

Theory Lectures: 54

Unit 1: Bryophytes (18 lectures)

- General characteristics of Bryophytes; Adaptations to land habit; Classification (Rothmaler); Alternation of generations.
- Classification (up to family), morphology, anatomy and reproduction of ***Marchantia***.
- Classification (up to family), morphology, anatomy and reproduction of ***Funaria***.
- Vegetative reproduction and economic importance of bryophytes.

Unit 2: Pteridophytes (18 lectures)

- General characteristics of Pteridophytes; Classification (Smith); Economic importance of Pteridophytes.
- Classification (up to family), morphology, anatomy and reproduction of ***Equisetum*** (Developmental details not to be included).
- Classification (up to family), morphology, anatomy and reproduction of ***Nephrolepis*** (Developmental details not to be included).
- Heterospory and seed habit.

Unit 3: Gymnosperms (18 lectures)

General characteristics, classification of Gymnosperms (Sporne, 1965).

- Affinities with Pteridophytes and Angiosperms.
- Morphology, anatomy (leaflets and coralloid root) and reproduction of ***Cycas*** (Developmental details not to be included).
- Economic importance of Gymnosperms.

B. Sc. Semester-III

Botany :: PC-BOT-302

Archegoniate

Practical

1. ***Marchantia***- Morphology of thallus, whole mount of rhizoids & scales, vertical section of thallus through Gemma cup, whole mount of Gemmae (temporary slides), vertical section of Antheridiophore, Archegoniophore, longitudinal section of Sporophyte (all permanent slides).

2. ***Funaria***- Morphology, whole mount of leaf, antheridial and archegonial heads, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads; longitudinal section of capsule and protonema.

3. ***Equisetum***- Morphology, transverse section of internode, longitudinal section of strobilus, transverse section of strobilus, whole mount of spores (wet and dry) (temporary slide), transverse section of rhizome (permanent slide).

4. ***Nephrolepis***- Morphology, vertical section of sporophyll, whole mount of sporangium, whole mount of spores (temporary slides), transverse section of rachis, whole mount of prothallus with sex organs and young sporophyte (permanent slide).

5. ***Cycas***- Morphology (coralloid roots, bulbil, leaf, microsporophyll, megasporophyll), vertical section of leaflet, whole mount of spores (temporary slides), vertical section of microsporophyll, longitudinal section of ovule (permanent slide).

Suggested Readings

Vashistha, P.C., Sinha, A.K., Kumar, A. (2010). Pteridophyta. S. Chand. Delhi, India.

Bhatnagar, S.P. & Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.

Parihar, N.S. (1991). An introduction to Embryophyta: Vol. I. Bryophyta. Central Book Depot. Allahabad.

Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi.

Vanderpoorten, A. & Goffinet, B. (2009) Introduction to Bryophytes. Cambridge University Press.

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN
CBCS - Semester - Grading Pattern
B. Sc.:: BOTANY :: SEMESTER-III
ES-BOT-301 :: Plant Diversity and Human Welfare

(Credits: Theory-2)
Theory Lectures: 30
(Effective from June-2021)

Unit 1: Plant Diversity **(15 lectures)**

- Plant diversity and its scope- Genetic diversity, Species diversity and Ecosystem diversity.
- Values and uses of Biodiversity: Ethical and aesthetic values, uses of plants (Food value), Uses of microbes.
- **Loss of Biodiversity:** Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agrobiodiversity.
- Conservation of diversity, *In situ* and *ex situ* conservation, Sustainable development.

Unit 2: Human Welfare **(15 lectures)**

- Importance of forestry their utilization and commercial aspects
- Avenue trees of India
- Ornamental plants of India.
- Alcoholic beverages through ages. Fruits and nuts: Important fruit crops their commercial importance. Wood and its uses.

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

B. Sc. :: BOTANY Practical :: SEMESTER-III

PC-BOT-301

(Effective from June-2021)

Date: **Place:**

Time: 5 Hrs **Total Marks: 50**

Instructions: Strictly follow the instructions given by examiner(s).

1. Identify and classify with giving reasons up to family of given specimen **A**. **08**

2. Identify and describe with structural peculiarities observed in the given specimen **B**. Draw the labelled diagram. **08**

3. Expose the pathogen from the given plant material **C** and prepare temporary slide. Make a labelled diagram and show your preparation to the examiner. **08**

OR

3. Make a temporary slide of the reproductive organ from the given specimen **C**. Draw the labelled diagram of it and show your slide to the examiner. **08**

4. Identify and describe as per given instructions: **16**

   1) Specimen – **D**: Permanent slide/charts (Unit – I Fungi)
   2) Specimen – **E**: Permanent slide/charts (Unit – II Lichens/Mycorrhiza)
   3) Specimen – **F**: Permanent slide/charts (Plant pathology)
   4) Specimen – **G**: Permanent slide/charts (Unit – I, II and III)

5. a. *Viva-voce* **05**

   b. Journal **05**

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

CBCS - Semester - Grading Pattern

B. Sc. :: BOTANY Practical :: SEMESTER-III

PC BOT-302

(Effective from June-2021)

Date: **Place:**

Time: 5 Hrs **Total Marks: 50**

Instructions: Strictly follow the instructions given by examiner(s).

1. Identify and classify giving reasons up to family of given specimen **A**. **08**

2. Identify and describe structural peculiarities observed in the given specimen **B**.
   Draw the labelled diagram. **08**

3. Make a temporary slide of the reproductive organ from the given specimen **C**.
   Draw the labelled diagram of it and show your slide to the examiner. **08**

4. Identify and describe as per given instructions: **16**
   1) Specimen – **D**: Permanent slide/charts (Bryophyta)
   2) Specimen – **E**: Permanent slide/charts (Pteridophyta)
   3) Specimen – **F**: Permanent slide/charts/specimen (Gymnosperm)
   4) Specimen – **G**: Permanent slide/charts (Unit – I, II and III)

5. a. *Viva-voce* **05**
   b. Journal **05**