

8-25 March, 2013 AC after Circulars from Circular No.153 & onwards

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DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY**CIRCULAR NO.ACAD/NP/B.Sc.-1st Yr./SEM.-I & II/157/2013**

It is hereby notified for information of all concerned that, on the recommendations of the Boards of Studies, Ad-hoc Boards, and Faculty of Science, the Academic Council at its meeting held on 25-03-2013 has accepted the following revised syllabi for B.Sc. First Year progressively under the Faculty of Science :-

Sr. No.	Revised Syllabus	
[1]	B.Sc. [Physics]	Semester-I & II,
[2]	B.Sc. [Dairy Science & Technology]	Semester-I & II,
[3]	B.Sc. [Industrial Chemistry]	Semester-I & II,
[4]	B.Sc. [Geology]	Semester-I & II,
[5]	B.Sc. [Chemistry]	Semester-I & II,
[6]	B.Sc. [Botany]	Semester-I & II,
[7]	B.Sc. [Electronics] Science	Semester-I & II,
[8]	B.Sc. [Fisheries]	Semester-I & II,
[9]	B.Sc. [Microbiology]	Semester-I & II,
[10]	B.A. [Statistics]	Semester-I & II,
[11]	B.Sc. [Statistics]	Semester-I & II,
[12]	B.Sc. [Zoology]	Semester-I & II,
[13]	B.Sc. [Textile and Interior Decoration]	Semester-I & II,
[14]	B.Sc. [Home Science]	Semester-I & II,
[15]	B.A. / B.Sc. [Mathematics]	Semester-I & II.

This is effective from the Academic Year 2013-2014 and onwards.

These syllabi are available on the University Website www.bamu.net

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.ACAD/NP/B.SC.-1ST YEAR/
Sem-I & II/2013/5132-541
A.C.S.A.I.No.327[9].

Date:- 08-05-2013.

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[Signature]
Director,
Board of College and
University Development.

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S-25 March, 2013 AC after Circulars from Circular No.153 & onwards

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Copy forwarded with compliments to :-

- 1] The Principals, affiliated concerned Colleges,
Dr. Babasaheb Ambedkar Marathwada University.
- 2] The Director, University Network & Information Centre, UNIC, with
a request to upload the above all syllabi on University Website
[www.bamu.net].

Copy to :-

- 1] The Controller of Examinations,
- 2] The Superintendent, [B.Sc. Unit],
- 3] The Superintendent, [B.A. Unit],
- 4] The Superintendent, [Eligibility Unit],
- 5] The Programmer [Computer Unit-1] Examinations,
- 6] The Programmer [Computer Unit-2] Examinations,
- 7] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter,
Dr. Babasaheb Ambedkar Marathwada University,
- 8] The Public Relation Officer,
- 9] The Record Keeper,
Dr. Babasaheb Ambedkar Marathwada University.

S/-080513/-

**DR. BABASAHEB AMBEDKAR
MARATHWADA UNIVERSITY,
AURANGABAD.**



Revised Syllabus of
B.Sc. 1ST YEAR
BOTANY
SEMESTER-I & II

[Effective from 2013-14 & onwards]

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD**B. Sc. I, Year Botany Curriculum****(SEMESTER PATTERN)****Effective from Academic year -2013-14****Course Structure**

Class	Paper No	Title of Paper	Lectures	Marks
B.Sc. I		SEMESTER - I		
	I	Diversity of Cryptogams -I	45	50
	II	Morphology of Angiosperms	45	50
	III	Practical Based on Theory Paper- I & II	45	50
		SEMESTER - II		
	IV	Diversity of Cryptogams – II	45	50
	V	Histology, Anatomy and Embryology	45	50
	VI	Practical based on Theory Paper No. IV & V	45	50

B. Sc. I Year (Theory)
Semester - I
Paper I
(Diversity of Cryptogams - I)

45L

Unit - 1**1.1 Viruses:**

General characters, classification based on host, economic importance,
 TMV – structure and multiplication (04)

1.2 Mycoplasma:

General characters (01)

1.3 Bacteria:

General characters, ultra structure, classification based on shape,
 reproduction, economic importance (05)

1.4 Cryptogams:

General characters, classification according to G.M. Smith up to class level (01)

1.5 Lichens:

General characters, nature of association, forms of thalli, economic
 importance, structure and reproduction in *Usnea* (04)

Unit - 2**2. Algae:**

2.1 General characters, classification according to F.E. Fritsch (1935)
 up to the class level, economic importance. (02)

2.2 Systematic position, occurrence, thallus structure, reproduction:-vegetative,
 asexual and sexual, (excluding development of sex organs) and graphic life
 cycle with respect to following types:

i. Cyanophyceae – *Nostoc* (02)

ii. Chlorophyceae – *Chara* (03)

iii. Xanthophyceae – *Botrydium* (02)

iv. Phaeophyceae – *Sargassum* (03)

v. Rhodophyceae – *Batrachospermum* (03)

Unit - 3**3. Fungi:**

3.1 General characters, classification according to Alexopoulos and
 Mims (1979) up to the class level, economic importance (03)

3.2 Systematic position, occurrence, structure of mycelium,
 reproduction - asexual, sexual and graphic life cycle with respect to the
 following types:

i) Oomycetes – *Albugo* (03)

ii) Zygomycetes – *Mucor* (02)

iii) Ascomycetes – *Eurotium* (02)

iv) Basidiomycetes – *Agaricus* (03)

v) Deuteromycetes – *Cercospora* (02)

B. Sc. I Year (Theory)
Semester - I
Paper - II
(Morphology of Angiosperms)

45L

Unit - 1

1.1- Basic body plan of flowering plant, modular type of growth, diversity of plant forms – Herbs, Shrubs, Trees, Climbers; annuals, biennials and perennials. (02)

1.2 Morphology of vegetative organs:

a) **Root:** Characteristics, functions, regions of root, types – tap and adventitious, modification of root for storage, mechanical support (stilt root) and vital functions (Pneumatophore). (04)

b) **Stem:** Characteristics, functions, modification – underground, sub aerial and aerial (03)

c) **Leaf:** Parts of typical leaf, phyllotaxy, types (simple and compound), diversity in shape and size, venation and modifications of leaf. (06)

Unit - 2**2. Morphology of reproductive organs:**

2.1 Inflorescence: Racemose, cymose and special types. (05)

2.2 Flower: Definition, parts of typical flower, forms of thalamus, androphore, gynophore, gynandrophore, insertion of floral whorls on thalamus (hypogyny, perigyny and epigyny), structure, function and modification of calyx, corolla, androecium, gynoecium, aestivation and placentation (15)

2.3 Fruit: Types of fruits (06)

2.4 Fruit and Seed: dispersal strategies. (04)

B. Sc. I Year (Practical)
Semester – I
Paper – III
Practical Based on Theory Paper No. I & II
(Diversity of Cryptogams – I & Morphology of Angiosperms)
45L

Diversity of Cryptogams- I

Note: Study of specimens of Bacteria, Algae, Fungi, through temporary mounting, permanent slides, field work and biovisual aids. Observation of disease symptoms in hosts infected by Fungi may be observed

1. Study of simple and compound microscope
2. Virus: Tobacco Mosaic Virus
3. Gram staining in bacteria, forms of Bacteria
4. **Algae:**
 - a) *Nostoc*
 - b) *Chara*
 - c) *Botrydium*
 - d) *Sargassum*
 - e) *Batrachospermum*
5. **Fungi:**
 - a) *Albugo*
 - b) *Mucor*,
 - c) *Eurotium*
 - d) *Agaricus*
 - e) *Cercospora*
6. **Lichens:** Form - Crustose, Foliose, Fruticose; *Usnea*

Morphology of Angiosperms

Note: Study of the following with the help of temporary mountings, permanent slides, charts, models, specimens and biovisual aids.

1. **Study of root and its modifications:**
 - a) Tap root
 - b) Adventitious root
 - c) Storage roots
 - d) Stilt root
 - e) Respiratory root.
2. **Study of stem and its modifications:**
 - a) Underground stem
 - b) Sub aerial stem
 - c) Aerial stem
3. **Study of leaf and its diversity:**
 - a) Types of leaf (Simple, Compound)
 - b) Shape and size
 - c) Venation
 - d) Phyllotaxy
 - e) Modifications
4. **Study of inflorescence:**

- a) Racemose
- b) Cymose
- c) Special

5. Study of flowers:

- a) Typical flower (*Hibiscus* / *Datura*)
- b) Hypogynous, Perigynous and Epigynous
- c) Aestivation
- d) Forms of corolla – cruciform, papilionaceous, infundibuliform and bilabiate
- e) Parts of typical stamen, adhesion and cohesion.
- f) Parts of typical carpel and placentation

6. Study of flowers with respect to pollination mechanism:

- a) *Calotropis*
- b) *Ocimum*
- c) *Salvia*
- d) *Helianthus*
- e) *Ficus*
- f) *Clitoria*

7. Study of fruits:

- a) Simple: legume, capsule, caryopsis, achene, drupe, berry.
- b) Aggregate: an etaerio of berries, an etaerio of follicles.
- c) Composite fruit: sorosis, syconus.

B. Sc. I Year (Theory)
Semester - II
Paper - IV
(Diversity of Cryptogams - II)

45 L.

Unit- 1

1. Bryophytes:

- 1.1 General characters of bryophytes, classification as per G. M. Smith (02)
1.2 Systematic position, occurrence, thallus structure (external and internal), reproduction -vegetative, asexual, and sexual (excluding developmental stages), graphic life cycle and alternation of generations of the following types:
a) Hepaticopsida – *Marchantia* (07)
b) Bryopsida – *Funaria* (06)

Unit-2

2. Pteridophytes:

- 2.1 General characters of Pteridophytes, classification as per G. M. Smith (02)
Systematic position, occurrence, external and internal structure of sporophyte and gametophyte, reproduction (excluding developmental stages), graphic life cycle and alternation of generations of the following types:
a) Psilopsida – *Psilotum* (03)
b) Lycopsida – *Lycopodium*, *Selaginella* (12)
c) Sphenopsida – *Equisetum* (06)
d) Pteropsida – *Marsilea* (07)

B. Sc. I Year (Theory)
Semester - II
Paper - V
(Histology, Anatomy and Embryology)

Unit - 1 Histology:	45 L.
a) Types of tissue:	
i. Meristematic tissue - Meristem, structure and types based on origin and position.	(03)
ii. Permanent tissues: Simple, Complex and Secretory	(06)
iii. Epidermal tissues: Trichomes and Stomata	(02)
b) Histological organization of root and shoot apices	(02)
c) Various theories of cellular organization	(02)
Unit - 2	
Anatomy:	
a) Primary structure of root, stem and leaf of Monocot (Maize) and Dicot (Sunflower)	(07)
b) Secondary growth in root and stem of Dicot (Sunflower)	(04)
c) Wood anatomy: Growth rings, heart wood and sap wood	(02)
d) Periderm: Origin, structure and functions.	(02)
Unit - 3	
Embryology:	
a) Structure of anther, microsporogenesis and development of male gametophyte.	(03)
b) Structure and types of ovule, megasporogenesis and development of female gametophyte (Polygonum type).	(04)
c) Pollination -Mechanism, types and agencies.	(02)
d) Double fertilization and its significance	(01)
e) Development of Dicot embryo (Crucifer type).	(01)
f) Structure, development and types of endosperm.	(02)
g) Structure of Dicot and Monocot seed	(02)

B. Sc. I Year (Practical)**Semester - II****Paper - VI****Practical Based on Theory Paper No. IV & V****45L****(Diversity of Cryptogams – II & Histology, Anatomy and Embryology)****Diversity of Cryptogams – II**

Note: Study of specimen of Bryophytes, and Pteridophytes through temporary mounting, permanent slides, field work and biovisual aids.

a) Bryophytes:i. *Marchantia*ii. *Funaria***b) Pteridophytes:**i. *Psilotum*ii. *Lycopodium*iii. *Selaginella*iv. *Equisetum*v. *Marsilea***Histology, Anatomy and Embryology****Histology:**

1. Meristem: root apex and shoot apex
2. Permanent tissues – simple, complex and secretory
3. Epidermal tissues: trichomes and stomata

Anatomy:

1. Anatomy of young dicot (Sunflower) and monocot (Maize) root.
(Double stained permanent slide preparation)
2. Anatomy of young dicot (Sunflower) and monocot (Maize) stem.
(Double stained permanent slide preparation)
3. Anatomy of dicot (Sunflower) and monocot (Maize) leaf.
(Double stained permanent slide preparation)

Embryology:

1. Study of T.S. of anther
2. Structure of ovule (anatropous), types of ovules
3. Study of Dicot and Monocot seed (embryo)

Note for Paper-III and VI:

Candidate shall submit the following at the time of practical exam.

1. Certified laboratory record book.
2. Field note book and Tour report.
3. Collection of specimens
4. Permanent slides of root stem and leaf.

In addition to number of practicals prescribed above, the students are required to undertake field excursions to the places of botanical interest and industrial places under the guidance of teacher. Collection of rare flowering and non flowering plants should be avoided during excursion. There shall be frequent study tours in local areas. T.A. and D.A. be paid to the teachers, peons and field collectors as per university rules. The record book is to be signed periodically by teacher in charge and certified by the Head of Department at the end of the term.

Candidate should not be allowed to appear for practical examination without a certified record book or a certificate from the Head of Department.

S*/-170313/-

S*/-110513/-

**DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD**

**Faculty of Science
Practical Examination
B. Sc. I YEAR (BOTANY)
Semester - I and II
Paper - III & VI**

(Diversity of Cryptogams I, Morphology of Angiosperms, Diversity of Cryptogams II and Histology, Anatomy and Embryology).

Time: 4 Hour Max.

Marks: 100

Date: _____

Batch No. _____

Center: _____

- Q.1. Identify, classify and describe any two algae from the given mixture 10
- Q.2. Identify, classify and describe the given specimen of fungi 10
- Q.3. Identify, classify and describe the given specimen (Bryophytes) on the basis of external and internal features. 10
- Q.4. Prepare temporary slide of the given specimen (Pteridophytes). Draw well labeled diagram. 10
- Q.5. Prepare a double stained permanent preparation of the given specimen. Identify and Draw a well-labeled diagram. 20
- Q.6. Identify and describe the specimen A, B, C, D and E as per the instructions 15
(A-Bacteria/Lichen, B- Morphology, C- Morphology, D -Histology, E- Embryology).
- Q.7. Submission:
- a) Record book, 10
 - b) Viva - voce 05
 - b) Collection, Tour report and field report 10

S-29 Nov., 2013 AC after Circulars from Circular No.55 & onwards

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डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ, औरंगाबाद**परिपत्रक क्रमांक/एस.यु./विज्ञान/अभ्यासक्रम/७४/२०१४**

या परिपत्रकाद्वारे सर्व संबंधितांना सुचित करण्यात येते की, विज्ञान विद्याशाखेने शिफारस केल्यानुसार बी. एससी. / एम. एससी. प्रथम व द्वितीय वर्षाच्या सुधारित अभ्यासक्रमास आणि बी. एससी. प्रथम वर्षाच्या अभ्यासक्रमात किरकोळ बदल करण्यास विद्यापरिषदेच्या वतीने मा. कुलगुरु यांनी, त्यांना प्राप्त असलेल्या विशेष अधिकार महाराष्ट्र विद्यापीठ अधिनियम-१९९४ कलम १४(७) अन्वये मान्यता दिलेली आहे. त्या अनुषंगाने सुधारीत तयार केलेल्या अभ्यासक्रमाची प्रत या परिपत्रकासोबत आपल्या पुढील कार्यवाहीसाठी पाठविण्यात येत आहे.

[1]	B.Sc. Physics	Semester-III & IV,
[2]	B.Sc. Chemistry	Semester-III & IV,
[3]	B.Sc. Botany	Semester-III & IV,
[4]	B.Sc. Zoology with minor changes	Semester-I & II,
[5]	B.Sc. Zoology	Semester-III & IV,
[6]	B.Sc. Fisheries	Semester-III & IV,
[7]	B.Sc. Electronics (Opt.)	Semester-III & IV,
[8]	B.A./B.Sc. Mathematics	Semester-III & IV,
[9]	B.Sc. Computer Science	Semester-I & II,
[10]	B.Sc. Information Technology	Semester-I & II,
[11]	B.C.A.	Semester-I & II,
[12]	B.Sc. Computer Science(Opt.)	Semester-I & II,
[13]	B.Sc. Information Technology(Opt.)	Semester-I & II,
[14]	B.Sc. Computer Application(Opt.)	Semester-I & II,
[15]	B.Sc. Computer Maintenance(Opt.)	Semester-I & II,
[16]	B.Sc. Biotechnology (Progressively)	Semester-I to VI,
[17]	B.Sc. Biotechnology (Opt.) (Progressively)	Semester-I to IV,
[18]	B.Sc. Sericulture Technology	Semester-I & II,
[19]	B.Sc. Networking Multimedia	Semester-III & IV,
[20]	B.Sc. Bioinformatics	Semester-I & II,
[21]	B.Sc. Hardware & Networking	Semester-I & II,
[22]	B.Sc. Animation	Semester-I & II,
[23]	B.Sc. Dairy Science & Technology	Semester-III & IV,
[24]	B.Sc. Biochemistry	Semester-III & IV,
[25]	B.Sc. Analytical Chemistry	Semester-III & IV,
[26]	B.Sc. Textile & Int. Decoration with minor changes	Semester-I & II,
[27]	B.Sc. Textile & Int. Decoration	Semester-III & IV,
[28]	B.Sc. Home Science with minor changes	Semester-I & II,
[29]	B.Sc. Home Science	Semester-III & IV,
[30]	B.Sc. Agro.Chem. & Fertilizers	Semester-III & IV,

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[31]	B.Sc. Geology	Semester-III & IV,
[32]	B.A. Statistics with minor changes	Semester-I & II,
[33]	B.A. Statistics	Semester-III & IV,
[34]	B.Sc. Statistics with minor changes	Semester-I & II,
[35]	B.Sc. Statistics	Semester-III & IV,
[36]	B.Sc. Industrial Chemistry	Semester-III & IV,
[37]	B.Sc. Horticultural	Semester-I & II,
[38]	B.Sc. Dry land Agriculture	Semester-I & II,
[39]	B.Sc. Microbiology	Semester-III & IV,
[40]	M.Sc. Computer Science	Semester-I to IV,
[41]	M.Sc. Information Technology	Semester-I to IV.

हा सुधारीत व नवीन तयार केलेल्या अभ्यासक्रमाचा आराखडा शैक्षणिक वर्ष २०१४-१५ करिता मर्यादित असेल व विद्यापरिषदेच्या अंतिम मान्यतेनंतर हे परिपत्रक नियमित ठेवण्याबाबत या कार्यालयाद्वारे नवीन परिपत्रक पारीत करण्यात येईल. तसेच सुधारीत व नवीन तयार केलेल्या अभ्यासक्रमाची प्रत विद्यापीठाच्या संकेतस्थळावर उपलब्ध आहे.

करिता, या परिपत्रकाची सर्व संबंधितांनी नोंद घ्यावी.

विद्यापीठ प्रांगण,
औरंगाबाद-४३१ ००४.
संदर्भ क्र.एस.यु./सा.शा./सबवि /२०१३-१४/
६५९९-७०२
दिनांक :- २७-०५-२०१४.

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संचालक,
महाविद्यालये व विद्यापीठ
विकास मंडळ.

या परिपत्रकाची एक प्रत :-

- १) मा. परीक्षा नियंत्रक, परीक्षा विभाग,
 - २) मा. प्राचार्य, सर्व संलग्नीत महाविद्यालये,
 - ३) संचालक, युनिक यांना विनंती करण्यात येते की, सदरील अभ्यासक्रम विद्यापीठाच्या संकेतस्थळावर उपलब्ध करुण देण्यात यावेत.
 - ४) संचालक, ई-सुविधा केंद्र, विद्यापीठ परिसर,
 - ५) जनसंपर्क अधिकारी, मुख्य प्रशासकीय इमारत,
 - ६) कक्ष अधिकारी, पात्रता विभाग, मुख्य प्रशासकीय इमारत,
 - ७) कक्ष अधिकारी, बी.ए. / बी.एससी. / बी.सी.एस./एम.एससी. विभाग, परीक्षा भवन,
 - ८) अभिलेख विभाग, मुख्य प्रशासकीय इमारती मागे,
- डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ, औरंगाबाद.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD.



REVISED SYLLABUS

OF

B.Sc. Botany
SECOND YEAR
[Optional]

Third & Fourth Semester

[Effective for - June, 2014-15]

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

B. Sc. II YEAR SYLLABUS

Subject -BOTANY

Semester –III and IV

	Paper No	Title of Paper	Lectures	Marks
B. Sc. II	Semester- III			
	VII	Taxonomy of Angiosperms	45	50
	VIII	Plant Ecology	45	50
	IX	Practical based on Paper - VII	45	50
	X	Practical based on Paper - VIII	45	50
	SEMESTER – IV			
	XI	Gymnosperms and Utilization of plants	45	50
	XII	Plant Physiology	45	50
	XIII	Practical based on Paper - XI	45	50
	XIV	Practical based on Paper - XII	45	50

Effective From – Academic year -2014-15

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

B.Sc. II YEAR (BOTANY)

Semester -III

Paper -VII

Taxonomy of Angiosperms

Period-45L

Unit-01

1. Salient features, origin and evolution of Angiosperms. (03)
2. Systems of classification –Introduction of Natural, Artificial and Phylogenetic. (01)
3. Bentham and Hooker's system of classification up to series level, its merits and demerits. (02)
4. Taxonomy in relation to anatomy, embryology, palynology, ecology and cytology. (05)
5. Concept of Binomial Nomenclature and its advantages . (02)
6. Concept of genus, species and epithet. (02)
7. Herbaria:- What is herbaria, procedure for collection of plants, pressing of the plants specimen, drying of specimen, poisoning, mounting, labelling of specimens, storing of specimen, function of herbaria and some important herbaria of the India; Digital herbaria. Botanical Gardens: What is botanical garden, functions of botanical garden and major botanical gardens of India. (05)

Unit: 02

Study of the following families: systematic position, salient features, floral formula, (25)
floral diagram, common examples and their economic importance.

i. Annonaceae

ii. Malvaceae

iii. Leguminosae

Fabaceae (Papilionaceae)

Caesalpiniaceae

Mimosaceae

iv. Apocynaceae

v. Solanaceae

vi. Acanthaceae

vii. Lamiaceae (Labiateae)

viii. Nyctaginaceae

ix. Liliaceae

x. Poaceae (Gramineae)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

B.Sc. II YEAR (BOTANY)

Semester -III

Paper -VIII

Plant Ecology

Period- 45L

Unit – 1

Plant and environment

A)Climatic factors –

- a) Light as an ecological factor, global radiation and photosynthetically active radiation (02)
- b) Temperature as an ecological factor. (02)
- c) Water as an ecological factor, physicochemical properties of water. (03)

B) Edaphic factor –

Soil formation, soil profile, physicochemical properties of soil, major soil types of India, soil erosion and soil conservation. (08)

Unit:2

1. Response of plants to water

Morphological, physiological and anatomical response of plants to water:– hydrophytes, xerophytes, halophytes and epiphytes. (12)

2. Phytogeography: (03)

Biogeographical regions of India, vegetation types of India.

Unit: 3

1. Community ecology:

Community characteristics -frequency, density, life forms, biological spectrum. (06)

1. Ecosystem:

Structure -biotic and abiotic components, food chain, food web, ecological pyramids, energy flow, biogeochemical cycles-nitrogen and phosphorus. (09)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

B.Sc. II YEAR (Practical)

Semester -III

Paper- IX

Taxonomy of Angiosperms

(Based on Paper- VII)

45 L

Angiosperms:

Study of locally available plants of the following families :

1. Annonaceae
2. Malvaceae
3. Leguminosae
 - a) Fabaceae (Papilionaceae)
 - b) Caesalpiniaceae
 - c) Mimosaceae
4. Apocynaceae
5. Solanaceae
6. Acanthaceae
7. Lamiaceae (Labiales)
8. Nyctaginaceae
9. Liliaceae
10. Poaceae (Gramineae)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

B. Sc. II year (Practical)

Semester - III

Paper - X

Plant Ecology

(Based on Paper no –VIII)

45 L

1. Study of morphological and anatomical adaptations in hydrophytes – *Hydrilla*, *Eichhornia*, *Typha* and *Nymphaea* .
2. Study of morphological and anatomical adaptations in xerophytes -*Aloe*, *Nerium*, *Casuarina*.
3. Study of morphological adaptations in halophytes -Pneumatophore, Stilt roots.
4. Study of morphological and anatomical adaptations in epiphytes.
5. Study of vegetation by quadrat method.
6. Estimation of Importance Value Index (IVI) of grassland ecosystem on the basis of relative frequency, relative density and relative abundance.
7. Determination of water holding capacity of different soils.
8. Study of meteorological instruments -Rain gauge, Hygrometer, Barometer.
9. Determination of percent leaf area injury of different infected leaf samples.
10. Estimation of salinity of different water samples.
11. Determination of pH of different soils by pH papers/universal indicator/pH meter.

Note for paper IX and X:

Candidate shall submit the following at the time of practical exams: Certified laboratory record book, Field note book, Tour report and Collection of specimens. In addition to number of practicals prescribed above, the students are required to undertake field excursions to the places of botanical interest and industrial places under the guidance of teachers. Collection of rare flowering and non flowering plants should be avoided during excursion. There shall be frequent study tours in local areas. T.A. and D.A. be paid to the teachers, peons and field collectors as per university rules. The record book is to be signed periodically by teacher in charge and certified by the Head of Department at the end of the term. Candidate should not be allowed to appear for practical examination without a certified record book or a certificate from the Head of Department.

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

B. Sc. II Year (Theory)

Semester - IV

Paper - XI

Gymnosperms and Utilization of Plants

45 L

Unit:1

Gymnosperms:

1. Salient features, classification as per Sporne 1965, economic importance. (02)
2. Geological time scale, fossilization, types of fossils, *Lyginopteris*, fossil fuels. (04)
3. Contributions of Prof. Birbal Sahani. (01)
4. Study of morphology, anatomy, reproduction (excluding developmental stages) and graphical representation of life cycle of the following types: (16)
 - a) Cycadales – *Cycas*
 - b) Coniferales – *Pinus*
 - c) Gnetales - *Gnetum*

Unit:2

Utilization of Plants:

1. Domestication of plants and their centers of origin. (02)
2. History, origin, cultivation, harvesting, improved varieties and economic importance of the following plants: (15)
 - i. Food plants – Wheat, Jowar.
 - ii. Sugar – Sugarcane.
 - iii. Fibers -Cotton, Jute.
 - iv. Vegetable oils – Groundnut, Sunflower.
 - v. Beverages – Tea, Coffee.
 - vi. Mushroom e. g. (Oyster) *Pleurotus*.
3. Botanical name, family name and economic importance of the following plants: (05)
 - i. Medicinal plants – Korphad, Aswagandha, Turmeric and Nirgudi.
 - ii. Timber and Gum – Teak, Neem, Babul, Sisham.
 - iii. Cosmetics and Perfumes – Rose, Mogara, Tuberose.
 - iv. Spices – Clove, Black pepper, Cumin, Coriander, Cinnamon.

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

B. Sc. II Year (Theory)

Semester -IV

Paper -XII

Plant Physiology

45 L

Unit:1

1. Plant water relations:

- a) Diffusion, osmosis, plasmolysis and imbibition. (02)
- b) Water absorption and ascent of sap (Transpiration pull theory). (03)
- c) Transpiration – Definition, types -cuticular, lenticular and stomatal, structure of stomata, mechanism of opening and closing of stomata (starch – sugar hypothesis). (02)

2. Mineral nutrition:

- a) Macro and microelements: roles and deficiency symptoms of N, P, K, Mg, Ca, Fe, Zn, Bo, Mo.
- b) Mineral uptake – passive (ion exchange theory) and active (carrier concept) . (05)

3. Translocation of solutes:

Mass flow hypothesis, protoplasmic streaming theory, Source and sink relationship. (03)

Unit:2

1. Enzymes :

Chemical nature holoenzyme , apoenzyme, prosthetic group, cofactor and coenzyme, properties , nomenclature, classification based on type of reactions, mechanism of enzyme action . (06)

2. Growth: Definition, Phases of Growth, Sigmoid growth curve. (02)

3.Growth regulators:

Discovery, structure, roles and practical applications of Auxins, Gibberellins, Cytokinins, Absciscic acid and Ethylene. (07)

Unit:3

1. Photosynthesis:

Definition, ultrastructure of chloroplast, photosynthetic pigments, Light reactions -Hill reaction, red drop and Emerson enhancement effect, two pigment systems (PS I, PS II), photophosphorylation – cyclic and non cyclic, Z-scheme; Dark reactions -C₃, C₄ and CAM pathways. (08)

2. Respiration:

Definition, Ultrastructure of mitochondria, types of respiration, Glycolysis, TCA Cycle, Electron transport system, alcoholic and lactic acid fermentation. (07)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

B.Sc. II year (Practical)

Semester -IV

Paper -XIII

**Gymnosperms and Utilization of plants
(Based on paper no - XI)**

45L

Gymnosperms:

a) *Cycas*

- i. Habit, young leaf, bulbils, male cone, microsporophyll, megasporophyll, pollen grains, mature seed.
- ii. Study through permanent slides-Normal root (T.S.). Stem (T.S.), Ovule (L.S.).
- iii. Study through hand section-Coralloid root (T.S.), Rachis (T.S.), Leaflet (T.S.).

b) *Pinus*

- i. Habit, long and dwarf shoot, scale leaves, foliage leaves, male cone, female cone, pollen grains (W.M.), winged seed.
- ii. Study through hand sections and permanent slides Root (T.S.), Stem (T.S.), Needle (T.S.).
- iii. Study through permanent slide - T.L.S. & R.L.S. of stem, L.S. of male cone, L.S. of female cone.

c) *Gnetum*

- i) Habit, T. S. of Stem, Male cone and female cone.

Paleobotany:

- a) Types of fossils (Specimens).
- b) *Lygynopteris* (Specimen / Permanent slide).

Utilization of plants :

- a) Food plants – Study of the morphology, structure, and histochemical tests of food storing tissue in Jowar & Wheat.
- b) Histochemical test of lignin and cellulose.
- c) Cultivation of Oyster (*Pleurotus*) mushroom on agricultural waste.
- d) Vegetable oils – hand section of Groundnut & Sunflower Seed and staining of oil droplets by Sudan III.
- e) Study of the sources of Timber, Gum, Medicinal plants, Cosmetics and Perfumes.
- f) Study of Black pepper, Clove, Cinnamon, Cumin, Coriander.
- f) Field notebook, specimen collection, and tour report.

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

B.Sc. II year (Practical)

Semester -IV

Paper- XIV

Plant Physiology

(Based on paper no. -XII)

45L

1. Osmosis by egg membrane and potato osmoscope.
2. Plasmolysis in *Tradescantia* leaves.
3. Effect of different conc. of organic solvents on membrane permeability.
4. Determination of water potential of any tuber.
5. Detection of mineral elements in plant ash.
6. Digestion of starch by amylase.
7. Detection of enzyme activity : oxidase, peroxidase, catalase and dehydrogenase.
8. Separation of chloroplast pigments by paper chromatography.
9. Demonstration of Hill reaction.
10. Effect of different intensities of light on photosynthesis.
11. Effect of different colors of light on photosynthesis.
12. Fermentation by Kuhnes fermentation vessel.
13. Isolation of starch.
14. Isolation of pectin.
15. Estimation of total and reducing sugars in fruit juice by Fehling solution.
16. Separation of amino acids by paper chromatography.
17. Effect of IAA and Gibberellins on seed germination.

Note for paper XI and XII

Candidate shall submit the following at the time of practical examination: Certified laboratory record book. Field report , Tour report. and Collection of specimens. In addition to number of practicals prescribed above, the students are required to undertake field excursions to the places of botanical interest and industrial places under the guidance of teachers. Collection of rare flowering and non flowering plants should be avoided during excursion. There shall be frequent study tours in local areas. T.A. and D.A. be paid to the teachers, peons and field collectors as per university rules. The record book is to be signed periodically by teacher in charge and certified by the Head of the Department at the end of the term. Candidate should not be allowed to appear for practical examination without a certified record book or a certificate from the Head of the Department.

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

Pattern of Theory Question Paper

B.Sc. II YEAR (BOTANY)

Semester -III

Paper -VII

Taxonomy of Angiosperms

Time: 2 Hour

Max. Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer question(Unit 1) 10

or

Long answer question (Unit 1)

Q.2. Long answer question(Unit 2) 10

or

Long answer question.....(Unit 2)

Q.3. Long answer question(Unit 2) 10

or

Long answer question.....(Unit 2)

Q.4. Short notes on any two of the following (based on all Units) 10

a) Short answer question

b) Short answer question

c) Short answer question

d) Short answer question

Q.5. Multiple choice question: (based on all Units) 10

1)(Unit 1)

2)(Unit 1)

3)(Unit 1)

4)(Unit 1)

5)(Unit 1)

6)(Unit 2)

7)(Unit 2)

8)(Unit 2)

9)(Unit 2)

10)(Unit 2)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science
Pattern of Theory Question Paper
B.Sc. II YEAR (BOTANY)
Semester -III
Paper -VIII
Plant Ecology

Time: 2 Hour

Max. Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer question(Unit 1) 10

or

Long answer question (Unit 1)

Q.2. Long answer question(Unit 2) 10

or

Long answer question.....(Unit 2)

Q.3. Long answer question(Unit 3) 10

or

Long answer question.....(Unit 3)

Q.4. Short notes on any two of the following (based on all Units) 10

- a) Short answer question
- b) Short answer question
- c) Short answer question
- d) Short answer question

Q.5. Multiple choice question: (based on all Units) 10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)
- 4)(Unit 2)
- 5)(Unit 2)
- 6)(Unit 2)
- 7)(Unit 3)
- 8)(Unit 3)
- 9)(Unit 3)
- 10)(Unit 3)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

Pattern of Theory Question Paper

B.Sc. II YEAR (BOTANY)

Semester- IV

Paper -XI

Gymnosperms and Utilization of plants

Time: 2 Hour

Max. Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer question(Unit -1) 10

or

Long answer question.....(Unit- 1)

Q.2. Long answer question(Unit- 1) 10

or

Long answer question(Unit-1)

Q.3. Long answer question(Unit- 2) 10

or

Long answer question(Unit- 2)

Q.4. Short notes on any two of the following (based on all Units) 10

a) Short answer question

b) Short answer question

c) Short answer question

d) Short answer question

Q.5. Multiple choice question: (based on all Units) 10

1)(Unit 1)

2)(Unit 1)

3)(Unit 1)

4)(Unit 1)

5)(Unit 2)

6)(Unit 2)

7)(Unit 2)

8)(Unit 2)

9)(Unit 2)

10)(Unit 2)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty Of Science

Pattern of Theory Question Paper

B.Sc. II YEAR (BOTANY)

Semester- IV

Paper- XII

Plant Physiology

Time: 2 Hour

Max. Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer question(Unit- 1) 10

or

Long answer question.....(Unit-1)

Q.2. Long answer question(Unit-2) 10

or

Long answer question(Unit-2)

Q.3. Long answer question(Unit- 03) 10

or

Long answer question(Unit-3)

Q.4. Short notes on any two of the following (based on all Units) 10

a) Short answer question

b) Short answer question

c) Short answer question

d) Short answer question

Q.5. Multiple choice question: (based on all Units) 10

1)(Unit 1)

2)(Unit 1)

3)(Unit 1)

4)(Unit 1)

5)(Unit 2)

6)(Unit 2)

7)(Unit 2)

8)(Unit 3)

9)(Unit 3)

10)(Unit 3)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty of Science

Practical Examination

B.Sc. II YEAR (BOTANY)

Semester- IV

Paper -IX and XIII

(Taxonomy of Angiosperm, Gymnosperms and Utilization of plants)

Time: 09.00 A.M. to 01.00 P.M.

Marks: 100

Date: _____ Batch No. _____

Center: _____

-
- | | |
|--|----|
| Q.1. Identify, classify giving reasons and describe the specimen "A" | 20 |
| Give floral formula and floral diagram. | |
| Q.2. Make a double stained permanent preparation of the given specimen 'B' | |
| (Gymnosperm). Identify and describe with a well labeled diagram. | 20 |
| Q.3.Perform Micro chemical test in given material "C" | |
| (Protein / Carbohydrate /Lipid / cellulose / Lignin) | 10 |
| Q.4. Identify and describe the specimen D, E, F, G and H as per the instructions | 25 |
| (D and E- Angiosperms, F- Gymnosperms, G- and H- Utilization of plants) | |
| Q.5. Submission: | 10 |
| a) Record book, | |
| b) Permanent slides and collection, field notebook/Tour report | 10 |
| c) Viva - voce and collection | 05 |

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,AURANGABAD

Faculty of Science

Practical Examination

B.Sc. II YEAR (BOTANY)

Semester IV

Paper X and XIV

(Plant Ecology and Plant Physiology)

Time: 02.00 P. M. to 06.00 P.M.

Marks: 100

Date: _____

Batch No. _____

Center: _____

-
- Q.1. Identify and describe morphological and anatomical adaptations in the given specimen. Make a temporary preparation of the given specimen. 20
- Q.2. Conduct the ecological experiment, allotted to you, write the principal and record the observations and results. 15
- Q. 3. Make a list of materials required for the physiological experiment allotted to you. Show it to the examiner, write the procedure and record the readings. 20
- Q. 4. Make a list of materials required for the physiology experiment allotted to you. Show results to the examiner. 20
- Q.5. Submission:
- a) Record book, 10
 - b) Project report and collection 10
 - c) Viva - voce 05

S-30th May, 2015 AC after Circulars from Circular No.1 & onwards

- 6 -

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO.ACAD/SU/Sci./B.Sc. & M.Sc. Syll./5/2015

It is hereby notified for information to all the concerned that, on the recommendation of the Faculty of Science the Academic Council at its meeting held on 30-05-2015 has accepted the **revised semester-wise syllabi as mentioned against their names in the Faculty of Science as under :-**

Sr. No.	Name of the Subject	Semester
[1]	B.Sc. Computer Science Degree Course	III & IV
[2]	B.Sc. Information Technology Degree Course	III & IV
[3]	B.C.A. Science Degree Course	III & IV
[4]	B.Sc. Animation Degree Course	III & IV
[5]	B.Sc. Bioinformatics Degree Course	III & IV
[6]	B.Sc. Computer Science [Optional]	III & IV
[7]	B.Sc. Information Technology [Optional]	III & IV
[8]	B.Sc. Computer Applications [Optional]	III & IV
[9]	B.Sc. Computer Maintenance [Optional]	III & IV
[10]	B.Sc. Environmental Science [Optional]	V & VI
[11]	B.Sc. Bio-Chemistry [Optional]	V & VI
[12]	B.Sc. Forensic Science Degree Course	V & VI
[13]	B.Sc. Industrial Chemistry [Optional]	V & VI
[14]	B.Sc. Electronics [Optional]	V & VI
[15]	B.Sc. Zoology [Optional]	V & VI
[16]	B.Sc. Microbiology [Optional]	V & VI
[17]	B.Sc. Instrumentation Practice [Optional]	V & VI
[18]	B.Sc. Statistics [Optional]	V & VI
[19]	B.A. Statistics [Optional]	V & VI
[20]	B.A. / B.Sc. Mathematics [Optional]	V & VI
[21]	B.Sc. Home Science Degree Course	V & VI
[22]	B.Sc. Textile Interior Decoration Degree Course	V & VI
[23]	B.Sc. Fishery Science [Optional]	V & VI
[24]	B.Sc. Dairy Science & Technology [Optional]	V & VI
[25]	B.Sc. Botany [Optional]	V & VI
[26]	B.Sc. Physics [Optional]	V & VI
[27]	M.Sc. Computer Science	III & IV
[28]	M.Sc. I.T.	III & IV

This is effective from the **Academic Year 2015-16 & onwards** as appended herewith.

All concerned are requested to note the contents of the circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.ACAD/SU/SCI./
2015/3761-4160
Date:- 16-06-2015.

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Director,
**Board of College and
University Development.**

..2..

S-30th May, 2015 AC after Circulars from Circular No.1 & onwards - 7 -

:: 2 ::

Copy forwarded with compliments to:-

- 1] The Principals, affiliated concerned colleges,
Dr. Babasaheb Ambedkar Marathwada University

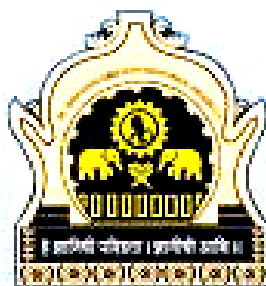
Copy to :-

- 1] The Controller of Examinations,
- 2] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter,
Dr. Babasaheb Ambedkar Marathwada University,
- 3] The Superintendent, [B.Sc. Unit],
- 4] The Superintendent, [M.Sc. Unit],
- 5] The Programmer [Computer Unit-1] Examinations,
- 6] The Programmer [Computer Unit-2] Examinations,
- 7] The Record Keeper.

==**==

S*/-160615/-

**DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD.**



REVISED SYLLABUS

OF

B.Sc. Botany

THIRD YEAR

Fifth & Sixth Semester
[Effective from - June, 2015-16 & onwards]

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD
Faculty of Science
B.Sc. III YEAR SYLLABUS
Subject- BOTANY
Semester- V AND VI

	Paper No.	Title of Paper	Lectures	Marks
		SEMESTER – V		
	XV	Cell Biology and Molecular Biology	45	50
B.Sc. III	XVI(A)	Diversity of Angiosperms - I	45	50
		OR		
	XVI (B)	Plant Breeding and Seed Technology		
		OR		
	XVI (C)	Plant Pathology	45	50
		OR Biotechnology		

	XVI(D)			
	XVII	Practical based on Paper - XV	45	50
	XVIII	Practical based on Paper - XVI	45	50
		SEMESTER – VI		
	XIX	Genetics and Biotechnology	45	50
	XX (A)	Diversity of Angiosperms - II	45	50
		OR		
	XX (B)	Economic Botany		
		OR		
	XX (C)	Microbiology and Disease Management	45	50
	XX (D)	OR		
		Bioinformatics		
	XXI	Practical based on Paper - XIX	45	50
	XXII	Practical based on Paper - XX	45	50

B.Sc. III Botany (Theory)
Semester -V
Paper XV
(Cell Biology & Molecular Biology)

(45L)

Unit-1

1. Cell:

Structure of Prokaryotic cell (Bacterial cell) and Eukaryotic cell
(plant cell)
(02)

2. Cell wall and cell organelles:

Structure and functions of cell wall and Cell organelles – Golgi complex,
Endoplasmic reticulum, Lysosomes
(08)

3. Nucleus:

Ultra structure, (nuclear membrane, nucleolus, chromatin material,
nucleoplasm), Functions of nucleus.
(05)

Unit-2

1. Cell division:

(06)
a) Cell cycle -G1 phase, S phase, G2 phase and M phase
b) Mitosis – definition, process and significance.
c) Meiosis-definition, process and significance.

2. Nucleic acids:

(09)

a. DNA: Definition, structure, chemical composition (nitrogenous bases, purines,

- pyrimidines, nucleosides, nucleotides, phosphate and sugars) Watson and Crick's model, Z - DNA, B - DNA, functions of DNA
- b. Replications of DNA – conservative, semi conservative and dispersive.
 - c. RNA: Structure, types and functions

Unit-3

1) Chromosome:

(07)

Definition, morphology-size, shape, number, Ultra structure – chromatid, chromonema, chromomere, centromere, kinetochore, secondary constriction, satellite, telomere, heterochromatin, euchromatin, Nucleosome model (Woodlock 1973), chemical composition, Functions of chromosome, Giant chromosomes-polytene and lampbrush chromosome.

2) Chromosomal aberrations :

(08)

- a) Structural-deletion, duplication, inversion and translocation
- b) Numerical: – euploidy and aneuploidy

B.Sc. III Year (Theory)

Semester – V

Paper XVI (A)

(Diversity of Angiosperms-I)

(45 L)

Unit: 1

1. Biodiversity

(03)

Definition, concept, origin and evolution

2. Types of biodiversity:

(05)

Species, genetic, ecological, cropland and agricultural diversity;
biodiversity in India; endemism and hot spots; threatened species,
threats to biodiversity

3. Conservation of biodiversity: (07)

Major causes for loss of biodiversity, listing of threatened biodiversity;
threatened categories – extinct, endangered, vulnerable, rare and indeterminate.
Conservation measures: – ex-situ, and in-situ; biodiversity conservation in India.

Unit -2

Phytotaxonomy: (08)

Classification of Angiosperms with special reference to Linnaeus,
A. P. de Candolle, Bentham and Hooker.

**Study of diversity following families with reference to the system
of classification of Bentham and Hooker**

(22)

- | | |
|--------------------|------------------|
| 1. Magnoliaceae | 2. Nymphaeaceae |
| 3. Papveraceae . | 4. Brassicaceae |
| 5. Capparidaceae . | 6. Rutaceae |
| 7. Rhamnaceae | 8. Combretaceae |
| 9. Lythraceae | 10.Cucurbitaceae |
| 11. Apiaceae | |

B. Sc. III Year (Theory)

Semester -V

Paper: XVI (B))

(Plant Breeding and Seed Technology) (45L)

Unit -1

Plant Breeding :

1. Introduction, history, aims and objectives (02)
2. Domestication, plant introduction and acclimatization (02)
3. Hybridization – history, hybridization procedure. (03)
4. Selection methods -mass selection, pureline selection and clonal selection (04)
5. Hybridization in self pollinating plants (03)
6. Hybridization in cross pollinating plants (03)
7. Heterosis and hybrid vigour (02)
8. Mutation in crop improvement (02)
9. Hybridization programme in Jowar and Cotton (06)
10. Experimental designs and biometrical techniques in plant breeding - Randomized block design, Latin square design, Analysis of variance, Assessment of variability, Simple measures of variability (03)

Unit -2

Seed Technology :

1. Seed technology -history, aims and objectives (01)
2. Morphology and anatomy of seed (monocot and dicot seed , endospermic and non endospermic seed) (02)
3. Stages of seed multiplication -
 - a. nucleus seed (04)
 - b. breeders seed
 - c. foundation seed
 - d. certified seed

e. registered seed

f. truthful seed

4. Seed certification process (02)
5. Stagewise multiplication of foundation and certified seed in Jowar and Cotton (02)
6. Seed processing – drying, cleaning, dressing, bagging, tagging, storage and marketing (02)
7. New techniques in seed technology (02)

B.Sc. III Year (Theory)

Semester –V

Paper XVI (C)

(Plant Pathology)

(45L)

Unit-1

Fundamentals of plant pathology:

1. Plant pathology – history, scope, losses due to pathogens, importance and need to study plant pathology (02)
2. Classification of plant diseases on the basis of symptoms and causal organisms – animate and inanimate (03)
3. Plant pathological institutes – IARI (Indian Agricultural Research Institute), ICRISAT(International Crop Research Institute for Semi Arid Tropics) (02)
4. Seed pathology – concept and importance of seed pathology, seed borne pathogens, methods to study seed borne pathogens (03)
5. Study of air borne pathogens: methods and applications (03)
6. Field and laboratory diagnosis of plant disease - Koch's postulates (02)

Unit-2

Plant diseases:

Study of the following diseases with respect to symptoms, causal organism, disease cycle and disease management:

- 1) **Cereals:**
 - a. Black stem rust of wheat (05)
 - b. Grain smut of jowar
 - c. Ergot of bajra
- 2) **Pulses:**
 - a. Wilt of pigeon pea (04)
 - b. Yellow vein mosaic of bean
- 3) **Vegetables:**
 - a. Late blight of potato (05)
 - b. Little leaf of brinjal
 - c. Black rot of onion (*Aspergillus*) (04)
- 4) **Oil seeds:**
 - a. Tikka disease of groundnut
 - b. Damping off of mustard
- 5) **Cash crops:**
 - a. Grassy shoot of sugarcane (06)
 - b. Downy mildew of grapes
 - c. Angular leaf spot of cotton d. Citrus canker
- 6) **Ornamentals:**
 - a. Powdery mildew of rose (02)
- 7) **Weeds:**
 - a. Rust of Euphorbia (02)

- 8) Trees:** a. *Cercospora* on *Albizzia* fruits (02)

B. Sc. III Year (Theory)

Semester- V

Paper XVI (D)

(Biotechnology)

(45L)

Unit- 1

Biotechnology:

1. **Introduction:**
 - a. Definition, scope and multidisciplinary nature (05)
 - b. Biotechnology in India
2. **DNA structure, replication and recombination:** (05)
 - a. Structure of DNA
 - b. Replication of DNA, Role of DNA polymerase
 - c. Denaturation and renaturation of DNA
 - d. Recombination
3. **Recombinant DNA technology:** (15)
 - a. Introduction, principles and procedure
 - b. Enzymes involved in recombinant DNA technology
 - c. Vectors
 - d. Southern and Northern blotting technique
 - e. Techniques in gene mapping
 - f. DNA fingerprinting g. PCR
 - h. DNA sequencing i. Genomics and DNA libraries
4. **Genetic engineering:** (05)
 - a. Introduction to transgenic plants
 - b. Vectors for gene deliveries
 - c. Marker and reporter genes
 - d. Role of agriculture in crop biotechnology
 - e. Achievements in plant biotechnology

Unit- 2

1. **Plant tissue culture:** (10)
 - a. Principles of tissue culture
 - b. Terminology in tissue culture
 - c. Cellular differentiation and totipotency
 - d. Organogenesis and embryogenesis
 - e. Protoplast isolation and culture
 - f. Meristem culture
 - g. Anther culture
 - h. Applications of tissue culture
2. **Research projects:** (05)

- a. Human genome project b. Plant genome project
- c. DBT, Ministry of Science and Technology.

B.Sc. III Botany (Practical)

Semester -V

Paper XVII

(Cell Biology & Molecular Biology)

(45 L)

Unit-1

1. Study of the cell structure from onion leaf or *Tradescantia* leaf
2. Preparation of cytological (AA, FAA etc.) fixatives and stains
(acetocarmine, aceto-orcein).
3. Study of electron micrographs of viruses, bacteria and cyanobacteria
4. Study of electron micrographs of eukaryotic cell and different cell organelles
5. Preparation of slides for the study of mitosis (root tips of onion)
6. Preparation of slides for the study of meiosis (*Rhoeo*, *Aloe* or onion flower buds)
7. Preparation of idiogram from the given micrograph of karyotype
8. Observation of giant chromosomes in *Chironomous* larvae
9. Preparation of wool models of mitosis, meiosis, cell structure, Chromosome, DNA and RNA.

B.Sc. III Year (Practical)
Semester – V
Paper XVIII (A)
(Diversity of Angiosperms-I)

(45 L)

Unit: 1

1. Study of herbarium
2. Study of analytical characters
3. Preparation of indented and bracketed keys
4. Study of following families:

1. Magnoliaceae
2. Nymphaeaceae
3. Papaveraceae
4. Brassicaceae
5. Capparidaceae
6. Rutaceae,
7. Rhamnaceae
8. Combretaceae
9. Lythraceae
10. Cucurbitaceae
11. Apiaceae,

5. Mounting of pollen grains (acetolysis method)

Note: Students should undertake excursion to ecologically different areas

for plant study and submission of list and photographs of wild plants at the

time

of practical examination.

B. Sc. III Year (Practical)
Semester -V
Paper: XVIII (B)
(Plant Breeding and Seed Technology)

(45 L)

Unit -1

Plant breeding:

1. Study of floral biology of jowar and cotton
2. Demonstration of male sterility in jowar
3. Artificial emasculation and pollination in jowar and cotton
4. Demonstration of hybridization techniques in jowar and cotton
5. Designing of field experiments
6. Visit to plant breeding centre

Seed technology:

1. Study of morphology and anatomy of monocot, dicot, endospermic and non endospermic seeds
2. Study of seed germination – observation of normal and abnormal seedlings, germination percentage
3. Blotter test
4. Method of breaking seed dormancy
5. Study of various seed processes – drying, cleaning, dressing, bagging, tapping and marketing
6. Preparation of seed certification tag
7. Viability test (Tetrazolium test)
8. Visit to various seed farms and research centres

B.Sc. III Year (Practical)
Semester –V
Paper XVIII (C)
(Plant Pathology)

(45L)

Unit-1

- 1.Study of Koch's postulates – isolation, inoculation and disease development
- 2.Study of the following diseases with respect to symptoms, causal organism, disease cycle and disease management
 - 1) **Cereals:**
 - a. Black stem rust of wheat
 - b. Grain smut of jowar
 - c. Ergot of bajra
 - 2) **Pulses:**
 - a. Wilt of pigeon pea
 - b. Yellow vein mosaic of bean
 - 3) **Vegetables:**
 - a. Late blight of potato
 - b. Little leaf of brinjal
 - c. Black rot of onion (*Aspergillus*)
 - 4) **Oil seeds:**
 - a. Tikka disease of groundnut
 - b. Damping off of mustard
 - 5) **Cash crops:**

- a. Grassy shoot of sugarcane
- b. Downy mildew of grapes
- c. Angular leaf spot of cotton
- d. Citrus canker

6) **Ornamentals:**

Powdery mildew of rose

7) **Weeds:**

Rust of Euphorbia

8) **Trees:**

Cercospora on *Albizzia* fruits

B. Sc. III Year (Practical)

Semester- V

Paper XVIII (D)

(Biotechnology)

(45L)

Unit- 1

1. Principle and working of instruments in biotechnology laboratory - Autoclave / Pressure Cooker, Centrifuge, Hot plate, Water bath, Laminar Air flow, Oven, Microscope, pH Meter, Refrigerator, Magnetic Stirrer, Shaker, Agarose Gel Electrophoresis, Green House etc.
2. Sterilization of glasswares
3. Preparation of sterile media, nutrient broth, PDA, M.S. medium, B5 medium, White medium
4. Isolation of bacteria and fungi from air
5. Demonstration of meristem culture
6. Demonstration of anther culture
7. Separation of amino acids by gel electrophoresis

B. Sc. III (Theory)
Semester -VI
Paper XIX
(Genetics and Biotechnology)

(45 L)

Unit : 1

1. Mendelism:

(04)

- i. Introduction -G.J. Mendel
- ii. Mendelian principles –Law of Dominance , law of segregation, law of independent assortment, back cross and test cross

2. Interaction of genes: (07)

- i. Allelic interaction: incomplete dominance, co dominance, lethal genes and blood group inheritance
- ii. Non allelic and non epistatic -comb shapes in fowls
- iii. Non allelic and epistatic:
 - a) Complementary genes or duplicate recessive epistasis (9:7)
 - b) Supplementary genes or recessive epistasis (9:3:4)
 - c) Dominant epistatic genes or dominant epistasis (12:3:1)
 - d) Duplicate genes or duplicate dominant epistasis (15:1)

3. Sex determination: (04)

- i. Chromosomal theory of sex determination
- ii. Mechanism of sex determination in man (xx -xy), Drosophila (xx and xy), birds (zz-zw), grasshopper (xx-xo) and genic balance theory in Drosophila
- iii. Sex determination in plants – *Melandrium*

Unit : 2

1. Sex linked inheritance: (07)

X, XY and Y linked inheritance:

- i) Colourblindness and hemophilia in man ii) Holandric genes
- iii) White eye colour in Drosophila iv) Gynandromorphs

2. Structure and function of gene: (08)

- i. Fine structure of gene (Seymour Benzer)
- ii. One gene one enzyme hypothesis
- iii. Genes and related diseases – phenylketonuria, and alkaptonuria
- iv. Detection of genetic diseases –amniocentesis Genetic counseling

Unit: 3

Biotechnology:

(15)

1. Concept of genetic engineering and recombinant DNA technology
2. Restriction endonucleases, their properties and uses
3. Cloning vectors -plasmids and phage vectors
4. Techniques of genetic engineering -isolation of desired gene, gene cloning, transfer of gene into plants
5. Applications of genetic engineering

B.Sc. III Year (Theory)
Semester – VI
Paper XX (A)
(Diversity of Angiosperms-II)

(45 L)

Unit: 1

Plant identification: keys, herbaria and botanical gardens

(04)

Origin of angiosperms: origin and evolution, Bennettitalean,

Ranalian and Caytonial theory

(05)

Binomial nomenclature: Principles and rules

(03)

Modern trends in taxonomy:

(03)

Cytotaxonomy, chemotaxonomy, and numerical taxonomy

Unit: 2

1.Phytotaxonomy:

(10)

Study of Engler & Prantle, Hutchinson, Takhtajan system of classification

2.Study of diversity of families:

(20)

- a. Asclepiadaceae
- b. Scrophulariaceae
- c. Oleaceae
- d. Convolvulaceae
- e. Verbenaceae
- f. Amaranthaceae
- g. Euphorbiaceae
- h. Orchidaceae
- i. Liliaceae
- j Commelinaceae

B. Sc. III Year (Theory)

Semester- VI

Paper: XX (B)

(Economic Botany)

(45L)

Unit -1

Origin, morphology, production, cultivation practices, harvesting and uses of crop plants.

- a) **Cereals:** Maize, Pearl millet and Rice
- b) **Pulses:** Bengal gram, Black gram and Pigeon pea
- c) **Oil seed crops:** Soybean, Mustard and Castor

Unit -2.

- a) **Fibre crops:** Jute, Sunhemp and Cotton
- b) **Horticultural crops:** Banana, Orange and Mango
- c) **Ornamentals:** Rose, Orchids and *Chrysanthemum*

Unit -3.

- a) **Beverages:** Tea and Coffee

- b) **Forage crops:** Cowpea, Jowar and Lucerne
- c) **Vegetable crops:** Brinjal, Potato, Tomato and Onion
- d) **Condiments and Spices:** Cardamom, Black pepper and Chillies

B.Sc. III Year (Theory)
Semester –VI
Paper XX (C)
(Microbiology and Disease Management)

(45L)

Unit-1

1. Microbiology

Microorganisms in biological world, their classification and features of different groups (03)

2. Microbial techniques:

- a. Microscopy – simple, compound and electron microscope
- b. Micrometry – Principle, working and uses
- c. Staining – common stains used in pathology, their preparation and significance, (cotton blue and Gram's Stain)
- d. Sterilization of glass wares and media (06)

3. Culture media for isolating plant pathogen

Industrial application of microorganisms - organic acids, alcohol, milk products, antibiotics and bio pesticides
(06)

Unit-2

Disease management:

- 1. Preventive methods: field sanitation, use of clean planting material, crop rotation, trap crops, time of sowing, planting distance and tillage
(02)

2. Control methods –

- a. Seed treatment: concept, objective, traditional and modern methods of seed treatment
(02)
- b. Soil sterilization: concept, objectives and methods (02)
- c. Fungicides: Definition, classification and ideal characteristics of fungicides, study of fungicides with respect to active ingredients, formulations, methods of application, mode of action and uses (08)
- i. Sulphur fungicides – Inorganic – Wettable sulphur, Organic – Thiram
- ii. Copper fungicides
- iii. Mercuric chloride – Agrosan – GN
- iv. Heterocyclic nitrogenous compounds – Captan
- v. Benzene compounds – Dethion

- vi. Antibiotics – Streptomycin and Aureofungin
- vii. Systemic – Bavistin and Vitavax
- d. Pesticides: Nicotin,Neem and pyrethrum (01)
- e. Rhodenticides – Zinc phosphoid (01)
- f. Nematicides- Nemagon, Propoxar (01)
- g Weedicides- 2,4-D (01)
- h. Biological control- definition, need, examples and role (02)
- Plant quarantine (01)
- 3. Control measures and environment: pollution due to chemicals, residual effects, toxicity, safe measures, colour code, antidote, symptoms of poisoning, precautions in using pesticides (03)
- 4. Pesticide application equipments: principle and working –pneumatic air pump knapsack sprayer, mist blower and duster, types of nozzles (03)
- 5. Plant clinic: Concept, objective and need (01)
- 6. Recent techniques in plant pathology: Genetically modified organisms (GMO's), B. T. Cotton, Pheromones (02)

B. Sc. III Year (Theory)
Semester- VI
Paper XX (D)
(Bioinformatics)
(45L)

Unit- 1

1. Introduction to bioinformatics and its applications (03)
2. Sampling, sample size, sampling techniques (03)
3. Data collection and presentation: (05)
 - a. Types of data
 - b. Methods of data collection
 - c. Data presentation - line chart, bar chart, histogram, polygon, ogive curve, pie diagram
4. **Measures of central tendency:** (04)
 - a. Mean
 - b. Median
 - c. Mode ,

Unit – 2

1. **Measures of variability:** (05)
 - a. Mean deviation,
 - b. Standard deviation
 - c. Coefficient of variation
 - d. Standard error
2. Probability, chi-square test, t – test (05)
3. Introduction to computer basics- general characters, types of computer (03)
4. Hardware-input and output devices, CPU, storage devices (02)

Unit – 3

1. Software – MSDOS, Windows, Linux, concept of files and folders and directories, (08)
Application software - Word processor, Spread sheet, Presentation, MS-access, html document
2. Networking technology - LAN, WAN, Arpanet, Internet, Web browsing and servers – Netscape navigator, Internet explorer, search engines like yahoo,

google etc. Introduction to MEDLINE, CCOD and PUBMED for biological
information, Introduction to bioinformatics software - bioperl biojava bioxml
(07)

B.Sc. III (Practical)
Semester -VI
Paper XXI
(Genetics and Biotechnology)

(45 L)

1. Quiz
2. Working out laws of inheritance by using seed mixtures
3. Problems based on gene interaction
4. Problems based on sex linked inheritance

B.Sc. III Year (Practical)
Semester – VI
Paper XXII (A)
(Diversity of Angiosperms-II)

(45 L)

1 . Study of following families:

1. Oleaceae
 2. Asclepiadaceae
 3. Convolvulaceae
 4. Scrophulariaceae
 5. Verbenaceae
 6. Amaranthaceae
 7. Euphorbiaceae
 8. Orchidaceae
 9. Liliaceae
 10. Commelinaceae
-
2. Mounting of pollen grains (acetolysis method) and measurement of pollen size.
 3. Study of different types of stomata and epidermal structures
(Trichome)
 4. Identification of plants up to species by using flora (Flora of Bombay
Presidency/ Flora of Marathwada)
 5. Students should undertake excursion to ecologically different areas for plant

study and submission of list and photographs of wild plants at the time of examination.

B. Sc. III Year (Practical)

Semester- VI

Paper: XXII (B)

(Economic Botany)

(45L)

Economic Botany:

1. Study of morphology, structure and simple histochemical tests of food storing tissues in Maize, Rice, Jowar, Gram, Pigeon pea, Potato
2. Study of histochemical tests of lignin and cellulose (Jute, Cotton, Sunhemp)
3. Hand section of Groundnut, Sunflower and staining of oil droplets
4. Study of plantation crops (Tea and Coffee)
5. Study of condiments and spices (Cardamom, Black Pepper and Chillies)
6. Study of horticultural crops (Banana, Orange and Mango)
7. Study of Vegetable crops (Brinjal, Potato, Onion, Tomato)
8. Study of ornamental plants (Rose and *Chrysanthemum*)

B.Sc. III Year (Practical)
Semester –VI
Paper XXII (C)
(Microbiology and Disease Management)

(45L)

1. Study of fungicides as per theory syllabus
2. Preparation of Bordeaux mixture, burgundy mixture and Bordeaux paste
3. Study of insecticides with respect to active ingredient, colour code, formulation, mode of action, antidote and uses
4. Study of *Trichoderma* culture
5. Study of plant protection equipments –pneumatic air pump, knapsack sprayer, mist blower cum duster
6. Principle and working of autoclave, laminar air flow, Tilak air sampler
7. Use of aerobiological techniques to study fungal spora (gravity slide method, Tilak air sampler)
8. Calibration of microscope and measurement of fungal spores
9. Sketching of fungal spore by camera lucida technique
10. Detection of organic acids from healthy and infected leaves by circular paper chromatography
11. Detection of Amino acids from healthy and infected leaves by circular paper chromatography
12. Study of pathogens in fruits from local market
13. Study of fungi from locally available seed samples
14. Preparation of sterile media - nutrient agar, potato dextrose agar
15. Preparation of stains and mounting media - cotton blue, lacto phenol and gram stain

B. Sc. III Year (Practical)

Semester- VI

Paper XXII (D)

(Bioinformatics)

(45L)

1. Use of operating system and creation of a job from word processor, spread sheet, presentation and data base
2. Creating files, folders and directories
3. Internet browsing and downloading information with special reference to biological literature
4. Creating an e - mail account, sending and receiving e - mail
5. Graphical presentation of data
6. Computer based statistical techniques
7. Frequency table of single discrete variable
8. Computation of mean, median, and mode
9. Computation of mean deviation, standard deviation, coefficient of variation, variance, and standard error
10. Computation of chi- square test, and t - test
11. Students should undertake a visit biotechnology industry, biotechnology research laboratory

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester V

Paper XV

(Cell Biology and Molecular Biology)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

Or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

Or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 3)

Or

Long answer type question(Unit 3)

10

Q.4. Write short notes on: (Any two) (Based on all Units)

10

- a) Short answer question
- b) Short answer question
- c) Short answer question
- d) Short answer question

Q.5. Multiple choice question:

10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)
- 4)(Unit 2)
- 5)(Unit 2)
- 6)(Unit 2)
- 7)(Unit 3)
- 8)(Unit 3)
- 9)(Unit 3)
- 10)(Unit 3)

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Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester V

Paper XVI (A)

(Diversity of Angiosperms - I)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

Or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

Or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 1)

Or

Long answer type question(Unit 2)

10

Q.4. Write short notes on: (Any two) (Based on all Units)

10

- a) Short answer question
- b) Short answer question
- c) Short answer question
- d) Short answer question

Q.5. Multiple choice question:

10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)
- 4)(Unit 1)
- 5)(Unit 1)
- 6)(Unit 2)
- 7)(Unit 2)
- 8)(Unit 2)
- 9)(Unit 2)
- 10)(Unit 2)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester V

Paper XVI (B)

(Plant Breeding and Seed Technology)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

Or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

Or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 1)

Or

Long answer type question(Unit 2)

10

Q.4. Write short notes on: (Any two)

(Based on all Units)

10

a) Short answer question

b) Short answer question

c) Short answer question

d) Short answer question

Q.5. Multiple choice question.

10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)
- 4)(Unit1)
- 5)(Unit 1)
- 6)(Unit 2)
- 7)(Unit 2)
- 8)(Unit 2)
- 9)(Unit 2)
- 10)(Unit 2)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester V

Paper XVI (C)

(Plant Pathology)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

Or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

Or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 1)

Or

Long answer type question(Unit 2)

10

Q.4. Write short notes on: (Any two) **(Based on all Units)**

10

- a) Short answer question
- b) Short answer question
- c) Short answer question
- d) Short answer question

Q.5. Multiple choice question.

10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)
- 4)(Unit1)
- 5)(Unit 1)
- 6)(Unit 2)
- 7)(Unit 2)
- 8)(Unit 2)

9)(Unit 2)

10)(Unit 2)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester V

Paper XVI (D)

(Biotechnology)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

Or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

Or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 1)

Or

Long answer type question(Unit 2)

10

Q.4. Write short notes on: (Any two) (Based on all Units)

10

- a) Short answer question
- b) Short answer question
- c) Short answer question
- d) Short answer question

Q.5. Multiple choice question.

10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)
- 4)(Unit1)
- 5)(Unit 1)
- 6)(Unit 2)
- 7)(Unit 2)
- 8)(Unit 2)
- 9)(Unit 2)
- 10)(Unit 2)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester VI
Paper XIX
(Genetics and Biotechnology)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 3)

10

or

Long answer type question(Unit 3)

Q.4. Write short notes on: (Any two) (**Based on all units**)

10

a) Short answer question

b) Short answer question

c) Short answer question

d) Short answer question

Q.5. Multiple choice question

10

1)(Unit 1)

2)(Unit 1)

3)(Unit 1)

4)(Unit1)

5)(Unit 2)

6)(Unit 2)

7)(Unit 2)

8)(Unit3)

9)(Unit 3)

10)(Unit 3)

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Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester VI

Paper XX (A)

(Diversity of Angiosperms - II)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 1)

10

or

Long answer type question(Unit 2)

Q.4. Write short notes on: (Any two) **(Based on all units)**

10

- a) Short answer question
- b) Short answer question
- c) Short answer question
- d) Short answer question

Q.5. Multiple choice question

10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)

- 4)(Unit1)
- 5)(Unit 1)
- 6)(Unit 2)
- 7)(Unit 2)
- 8)(Unit 2)
- 9)(Unit 2)
- 10)(Unit 2)

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Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester VI

Paper XX (B)

(Economic Botany)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 3)

10

or

Long answer type question(Unit 3)

Q.4. Write short notes on: (Any two) (Based on all units)

10

- a) Short answer question
- b) Short answer question
- c) Short answer question
- d) Short answer question

Q.5. Multiple choice question

10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)
- 4)(Unit 2)
- 5)(Unit 2)
- 6)(Unit 2)
- 7)(Unit 3)
- 8)(Unit 3)
- 9)(Unit 3)
- 10)(Unit 3)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester VI

Paper XX (C)

(Microbiology and Disease Management)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 1)

10

or

Long answer type question(Unit 2)

Q.4. Write short notes on: (Any two) (On both unit)

10

- a) Short answer question
- b) Short answer question
- c) Short answer question
- d) Short answer question

Q.5. Multiple choice question

10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)
- 4)(Unit1)
- 5)(Unit 1)
- 6)(Unit 2)
- 7)(Unit 2)
- 8)(Unit 2)
- 9)(Unit 2)
- 10)(Unit 2)

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Faculty of Science

Pattern of Theory Question Paper

B.Sc. III YEAR (BOTANY)

Semester VI

Paper XX (D)

(Bioinformatics)

Time: 2 Hours

Max.

Marks: 50

N.B.: i) Attempt all questions

ii) All questions carry equal marks

iii) Draw neat and well-labelled diagrams wherever necessary

Q.1. Long answer type question(Unit 1)

10

or

Long answer type question(Unit 1)

Q.2. Long answer type question(Unit 2)

10

or

Long answer type question(Unit 2)

Q.3. Long answer type question(Unit 3)

10

or

Long answer type question(Unit 3)

Q.4. Write short notes on: (Any two) (Based on all units)

10

a) Short answer question

b) Short answer question

c) Short answer question

d) Short answer question

Q.5. Multiple choice question

10

- 1)(Unit 1)
- 2)(Unit 1)
- 3)(Unit 1)
- 4)(Unit 2)
- 5)(Unit 2)
- 6)(Unit 2)
- 7)(Unit 3)
- 8)(Unit 3)
- 9)(Unit 3)
- 10)(Unit 3)

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Faculty of Science

Practical Examination

B.Sc. III YEAR (Semester – V &VI)

BOTANY

Paper XVII and XXI

Practical based on paper-XV & XIX

(Cell Biology and Molecular Biology, Genetics and Biotechnology)

Time: 09.00 a.m. to 01.00 p.m.

Max. Marks: 100

Date: _____

Batch No.

Center: _____

- Q.1. Prepare a temporary squash of the given material. Identify and describe any two stages. (Mitosis) 15
- Q.2. Prepare a smear from the given material. Identify and describe any one stage (Meiosis) 10
- Q.3 Prepare a temporary squash of the given material. Identify and describe Giant Chromosome. (chironomous larvae) or 10
- Prepare of idiogram of the given karyotype and comment.
- Q.4. Prepare a temporary preparation of given material (Cell structure / Cyclosis) or 10
- Quiz based on Cell Biology, Molecular Biology, Genetic and Biotechnology (Any ten)
- Q.5. Problem based on interaction of gene. 15
- Q.6. Problem based on sex linked inheritance. 15
- Q.7. Submission
- a) Record book, 10
- b) Woolen models 10
- c) Viva - voce 05

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Faculty of Science

Practical Examination

B.Sc. III YEAR (Semester – V&VI)

BOTANY

Paper XVIII and XXII (A)

Practical based on paper-XVI & XX

(Diversity of Angiosperms – I and II)

Time: 02.00 a.m. to 06.00 p.m.

Max. Marks: 100

Date: _____

Batch No.

Center: _____

Q.1. Identify, classify giving reasons and describe the specimen 'A' and 'B' up to family level. Give floral formula and floral diagram

30

Q.2. Identify the specimen 'C' up to the species level with the help of flora. 10

Q.3. Prepare a temporary slide of specimen 'D'

05

Q.4. Prepare a temporary slide of specimen `E` (Pollen grains)

05

Q.5. To determine analytical and synthetic characters between specimen provided

05

Q.6. Identify and describe the specimens as per the instructions (Four spots)

20

(2 Spots- Morphology, 2 Spots-Eco. imp.)

Q.4. Submission:

a) Record book, 10

b) Project report /Tour report and Herbarium

10

c) Viva - voce 05

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Faculty of Science

Practical Examination
B.Sc. III YEAR (Semester – V&VI)
BOTANY
Paper XVIII and XXII (B)
Practical based on paper-XVI & XX

(Plant Breeding, Seed Technology and Economic Botany)

Time: 02.00 a.m. to 06.00 p.m.

Max. Marks: 100

Date: _____

Batch No.

Center: _____

Q.1. Explain hybridization technique in given plant

20

Q.2. Preparation of seed certification tag

10

Q.3. Viability test of given seeds

10

Q.4. Histochemical test in given material `A`

(Starch/Protein/Lipid/Cellulose/Lignin)

10

Q.5. Identify and describe the specimens B, C, D,E and F as per instructions

25

(B-Plant breeding, C-Seed technology, D, E and F-Economic Botany).

Q.6. Submission:

a) Record book	10
b) Tour report and collection	10
c) Viva - voce	05

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Faculty of Science

Practical Examination

B.Sc. III YEAR (Semester – V & VI)

BOTANY

Paper XVIII and XXII (C)

Practical based on paper-XVI & XX

(Plant Pathology, Microbiology and Disease Management)

Time: 02.00 a.m. to 06.00 p.m.

Max. Marks: 100

Date: _____

Batch No.

Center: _____

Q.1. Identify and describe the symptoms and causal organisms of the specimen 'A' and

20

'B' Explain on the basis of external and internal characters

Q.2. Calibrate the microscope, measure the given spore and sketch with Camera Lucida

15

technique.

Q.3. Identify and describe fungal specimens from culture media/seed fungi/fruit fungi

10

Q.4. Prepare fungicides as per instructions

10

Or

Detection of organic acids/amino acids from infected and healthy leaves by circular paper chromatography

Q.5. Identify and describe as per instructions (C, D, E, and F)

20

(C- apparatus, D- pesticide/fungicide, E- diseased plant, F- fungal spore).

Q.6. Submission:

a) Record book

10

b) Project report / Tour report and collection 10

c) Viva - voce 05

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Faculty of Science

Practical Examination

B.Sc. III YEAR (Semester – V&VI)

BOTANY

Paper XVIII and XXII (D)

Practical based on paper-XVI & XX

(Biotechnology and Bioinformatics)

Time: 02.00 a.m. to 06.00 p.m.

Max. Marks: 100

Date: _____

Batch No.

Center: _____

Q.1. Identify the experiment and describe principle and procedure

(Meristem Culture / Anther Culture / Protoplast Culture)

10

Q.2. Separation of amino acids by gel electrophoresis

Or

Identify contaminating bacteria and fungi from the given culture

10

Q.3. Calculate mean, standard deviation, coefficient of variation and standard error

15

of the Provide data

Q.4. Prepare a job using-

15

Word processor/spread sheet/presentation/database

Or

Represent given data by graphical method

Q.5. Identify and describe the given specimens A, B, C, D, E as per instructions

25

Q.6. Submission:

a) Record book

10

b) Project report and Tour report

10

c) Viva - voce

05

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