Professor and Chairman BOS
Dept. of P.G. Studies and
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Proceedings of the meeting of Graduate Botany held on 11th January 2019 in the Chairman's Chamber, Department of Applied Botany.

The meeting of the Board of studies in UG Botany held on 11th January 2019 at 11.30 A.M in the department of P.G. Studies and Research in Applied Botany. The meeting was attended by the following members.

Members present:-

1. **Dr. N. Rajeshwari** - Raj 11-1-2019
2. **Smt. Kiranmae P Nagwand** - Kiranmae Pyre
3. **Mr. Sudhakara.H.N** - 11/1/2019
4. **Dr. Dharmendra** - 11.1.2019

The agenda was discussed, resolved and recorded as follows :-

1. Examiners list for 2019-20 was prepared, approved and authorized to the Chairman for needful action.
2. Members have discussed and approved the syllabus of seed technology S.S. College, Shimoga. The meeting was concluded with thanks from chairman.

11/1/19

Chairman
BOS UG-Botany
Chairman
BOS Graduate Botany
Kuvempu University
Shankaraghatta-577 451

KUVEMPU UNIVERSITY

B.Sc., SEED TECHNOLOGY PROGRAMME

Course Curriculum and Scheme of Evaluation

Semester	Theory Paper	Max. theory marks	Theory IA marks	Practical Max. marks	Project/ Dissertation Assignment field work
First	PI – SEED DEVELOPMENT, SEED MORPHOLOGY AND FLORAL STRUCTURES.	50	10	40	
Second	P II – SEED PHYSIOLOGY AND CYTOGNECTICS	50	10	40	
Third	P III – PLANT BREEDING AND CROP IMPROVEMENT	50	10	40	
Fourth	P IV – SEED PRODUCTION AND SEED POROCESSING	50	10	40	
Fifth	P V – SEED STORAGE AND SEED TREATMENT	50	10	40	
	P VI – SEED CERTIFICATION, SEED LEGISLATION AND SEED MARKETING	50	10	--	40
Sixth	P VII – SEED QUALITY AND BIODETERIORATION	50	10	40	--
	P VIII - SEED PATHOLOGY AND SEED ENTOMOLOGY	50	10	40	

SEED DEVELOPMENT, SEED MORPHOLOGY AND FLORAL STRUCTURES

THEORY:

Theory Marks - 50

IA marks for theory - 10

Total No. of Teaching hr. per Sem. - 60 hr.

Total No. of Teaching hr. per week - 04 hr.

Duration of Theory Exam - 03 hr.

PRATICAL:

Based on theory Paper – 1

Max. marks - 40

Total No. of Practical's per week - 01.

Duration of practical's - 03hr.

Duration of Practical Examination - 03 hr.

Introduction on seed technology and importance - 02hr

Unit-2-

Brief Introduction on the families of Fabaceae, Solanaceae, Asteraceae, Malvaceae and Poaceae, their characteristic features and floral structures. - 10hr

Unit-3

Microsporogenesis- Male gametophyte development and Megasporogenesis-Female gametophyte development in flowering plants - 06hr

Unit-4

Pollination –Definition, Different types of Pollination and Fertilization - 08hr

Unit-5

Structure and development of monocot and dicot seed
a) Texture b) Embryo - 13hr

Unit-6

Apomixis and Parthenocarpy - 04hr

Unit-7

Classification of fruits, Methods of dehiscence and dispersal mechanism of fruits and seeds - 07hr

Unit-8

Morphology of seeds with special reference to Varietal Identification (Phenol Colour test and Cotton Grow Out Test) - 10hr

Paper – I: Seed Development, Seed Morphology and Floral Structures

Max. Marks – 50 Time: - 03 hours

Instruction to the candidates:

1) Answer all Questions

2) Draw the diagram wherever necessary

I Answer the following in a Word or A Sentence 6X1=6

1.
2.
3.
4.
5.
6.

II Short Answer Questions
Answer any Four of the following 4X3=12

7.
8.
9.
10.
11.
12.

III Medium Answer Questions 2X6=12
Answer any TWO of the following

13.
14.
15.
16.

2X10=20

IV Long Answer Questions
Answer any TWO of the following

17.
18.
19. Write short note on a)
b)

Paper – I: Seed Development, Seed Morphology and Floral Structures

Max. Marks – 40 Time: - 03 hours

Based on theory syllabus

1. Developmental studies on male and female gametophytes (Slide observation)
2. Morphology of Dicot and Monocot plant, flower and seed
3. Endospermic and non endospermic seeds (available)
4. Embryo and endosperm mounting of available seed samples
5. Study on floral structure of the families studies in theory paper
6. Identification of seeds of common crops (Cereals, Pulses, Oilseeds, fruits and Vegetables)

B.Sc. SEED TECHNOLOGY
FIRST SEMESTER
Practical -I model question paper

Seed Development, Seed Morphology and Floral Structures

Max. Marks – 40 **Time: - 03 hours**

Q-I. Identify the specimens A, B & C Sketch , label & give reasons -09

Q-II. Write critical notes D & E, -05

Q-III. Identify and comment on specimen F, G & H - 06

Q-IV. Identify the slides I, J, K & L with sketch and label -10

Record -05
Viva -05

SCHEME OF EVALUATION FOR SEED TECHNOLOGY
First semester Practical-I

Seed Development, Seed Morphology and Floral Structures

Max. Marks – 40 Time: - 03 hours

I Identify the specimens A, B & C Sketch, label and Give reasons. -09-
Identification =01
Sketch & label =1½
Reasons = ½
(Dicot/monocot plant / flower ; Endospermic/ Non endospermic seed)

II Write critical notes on D & E -05-
Identification =01
Critical notes = 1½
(From studied Families)

III Identify and comment F, G & H -06-
Identifiaction = 01
comment = 01
(Seed Morphology –Oil, vegetable, cereals, pulses, and Fruit Seed)

IV Identify the slides/specimen I, J, K & L with reasons -10-
Identification =01
Reasons =1½
(Microsporogenesis, Megasporogenesis, Dicot Embryo, Monocot Embryo, Endosperm)

V Record -05-

VI Viva-voce -05-

B.Sc. SEED TECHNOLOGY
SECOND SEMESTER
Paper II ( ) Q.P. Code –

SEED PHYSIOLOGY AND CYTOGENETICS

THEORY:

Theory Marks	- 50
IA marks for theory	- 10
Total No. of Teaching hr. per Sem.	- 60 hr.
Total No. of Teaching hr. per week	- 04 hr.
Duration of Theory Exam	- 03 hr.

PRATICAL:

Based on theory Paper – II

Max. marks	- 40
Total No. of Practical's per week	- 01.
Duration of practical's	- 03hr.
Duration of Practical Examination	- 03 hr.

Unit-1

Physiology of seed development, ripening and maturation
Process and types of Seed Dormancy.

Unit-2

Breakdown of different seed storage products during germination.

Unit-3

Hormonal regulation, Enzymatic activity during seed germination.

Unit-4

Seed viability and Seed Vigour tests.

Unit-5

Factors responsible for seed deterioration.

Unit-6

Physical and chemical factors and their implications on seed quality.

Unit-7

Cytogenetics-Structure of Chromosomes, Nucleosome model,

Mitosis and Meiosis, Mendelian Laws (Mono & Dihybrid Cross)

Interaction of genes (Complementary and Epistasis with special reference to Crop plants).

B. Sc., SEED TECHONOLOGY

Model Question paper II

Paper II ( ) Q.P. Code -

Paper II SEED PHYSIOLOGY AND CYTOGENETICS

Max. Marks – 50 Time: - 03 hours

Instruction to the candidates:

1) Answer all Questions

2) Draw the diagram wherever necessary

I Answer the following in a Word or A Sentence 6X1=6

1.
2.
3.
4.
5.
6.

II Short Answer Questions

Answer any Four of the following 4X3=12

7.
8.
9.
10.
11.
12.

III Medium Answer Questions 2X6=12

Answer any TWO of the following

13.
14.
15.
16.

IV Long Answer Questions 2X10=20

Answer any TWO of the following

17.
18.
19. Write short note on a)

10

SEED PHYSIOLOGY AND CYTOGENETICS

Max. Marks – 40 Time: - 03 hours

Based on theory syllabus

1. Solve the genetic problem
   (Atleast 08 problems from Mono & Dihybrid cross)
2. Mitosis and Meiosis (Allium cepa)
3. Seed Quality Testing (Germination, Vigour)
4. Three Bean Experiment
5. Seed Viability tests (TTC Test)

B.Sc. SEED TECHNOLOGY
SECOND SEMESTER
Practical -II model question paper

SEED PHYSIOLOGY AND CYTOGENETICS

Max. Marks – 40 **Time: - 03 hours**

Q-I Prepare Squash/Smear of A.
Sketch, Label & Identify any two stages
(Leave the preparation for evaluation) -09

Q-II. Solve the genetic problems B -05

Q-III. Comment on C, D & E - 06

Q-IV. Identify the slides / specimen F,G, H & I
Comment with reasons -10

Record -05

SCHEME OF EVALUATION FOR SEED TECHNOLOGY
Second semester Practical-II

SEED PHYSIOLOGY AND CYTOGENETICS

Max. Marks – 40 Time: - 03 hours

I Prepare a squash / smear of A -09-
.Sketch, Label and Identify any two stages
Preparation= 03
Identification =02 (two stages)
Sketch & label = 02
Reasons = 02
(Onion Root tip / Flower Buds)

SCHEME OF EVALUATION FOR SEED TECHNOLOGY
Second semester Practical-II

II Solve the Genetic Problem B -05-
(One probem from Mono/ Dihybrid cross)

III Identify and comment on C, D, E -06-
Identifiaction = 01
comment = 01
(Germination/ Viability/ Vigor)

IV Identify the slides/specimen F, G, H & I comment with reasons -10-
Identification =01
Reasons =1½
(Mitosis/ Meiosis/ Vigor/ Viability)

V Record -05-

VI Viva-voce -05-

B.Sc. SEED TECHNOLOGY
THIRD SEMESTER
Paper III ( ) Q.P. Code -

PLANT BREEDING AND CROP IMPROVEMENT

THEORY:

Theory Marks	-	50
IA marks for theory	-	10
Total No. of Teaching hr. per Sem.	-	60 hr.
Total No. of Teaching hr. per week	-	04 hr.
Duration of Theory Exam	-	03 hr.

PRATICAL:

Based on theory Paper – III

Max. marks	-	40
Total No. of Practical's per week	-	01.
Duration of practical's	-	03hr.
Duration of Practical Examination	-	03 hr.

Introduction:
Scope and objectives of plant breeding

Unit-2

Mode of reproduction in plants, types of reproduction [Sexual, Asexual reproduction] and Vegetative propagation -06-hr

Unit-3

Sterility and incompatibility: Definition, types [Cytoplasmic Male Sterility, Genetic Male Sterility and Cytoplasmic-Genetic Male Sterility] utility of male sterility and self incompatibility in crop improvement -09-hr

Unit-4

Selection: Definition, characters, techniques and importance of Mass selection, Clonal selection and pure line selection -05-hr

Unit-5

Hybridization: Definition, techniques, hybrid vigour. -10-hr

Unit-6

Breeding for disease resistance: Definition, nature of disease resistance, causes of disease resistance, and methods of breeding for disease resistance; scope and applications. -10-hr

Unit-7

Mutations in crop improvement: Definition, classification, artificial induction of mutation and importance of indeed mutations in crop improvement. -10-hr

Unit-8

Biotechnology in Crop improvement: Tissue culture, anther culture, transgenic plants, artificial seeds and somatic embryoids. -14-hr

B.Sc., SEED TECHONOLOGY

Model Question paper III

Paper III ( ) Q.P. Code -

PLANT BREEDING AND CROP IMPROVEMENT

Max. Marks – 50 Time: - 03 hours

Instruction to candidates

1) Answer all Questions

2) Draw the diagram wherever necessary

I Answer the following in a Word or A Sentence 6X1=6

1.
2.
3.
4.
5.
6.

II Short Answer Questions
Answer any Four of the following 4X3=12

7.
8.
9.
10.
11.
12.

III Medium Answer Questions
Answer any TWO of the following 2X6=12

13.
14.
15.
16.

IV Long Answer Questions 2X10=20
Answer any TWO of the following

17.
18.
19. Write short note on a)
b)

Practical Syllabus

Paper – III Plant breeding and Crop improvement

Max. Marks – 40

Time: - 03 hours

Based on theory syllabus

1. Vegetative Propagation methods: Layering, Grafting, Gootee.
2. Study of Floral Morphology: Dicot (some legumes) and monocot (Paddy)
3. Study types of grains and Pollens Viability and Fertility.
4. Emasculation and bagging techniques: Hand emasculation.
5. Tissue culture techniques and Production of Synthetic seeds

B.Sc. SEED TECHNOLOGY
THIRD SEMESTER
Practical -III model question paper

Plant breeding and Crop improvement

Max. Marks – 40

Time: - 03 hours

Q-I. Identify the specimens A, B & C sketch, label and give reasons. -09

Q-II. Write critical notes D&E techniques: Hand emasculation -05

Q-III. Calculate the Pollen Fertility/ Viability of F. -06

Q-IV. Identify the specimens G, H, I & J with reasons -10

Record -05

Viva -05

Plant Breeding and Crop Improvement

Max. Marks – 40

Time: - 03 hours

I Identify the specimens A, B & C. Give reasons. -09-
Identification =01
Sketch & label =1½
Reasons = ½
(Propagation / Floral Morphology)

II Write critical notes on D & E -05-
Identification =01
Critical notes = 1½
(Emasculation/ Bagging/ Synthetic Seeds)

III Calculate the Pollen Fertility / Viability of F. -06-
Procedure =02
Preparation=02
Calculations=02

IV Identify the specimens G, H, I & J with reasons -10-
Identification =01
Reasons =1½
(Propagation/ Emasculation/ Bagging)

V Record -05-

VI Viva-voce -05-

SEED PRODUCTION AND PROCESSING

THEORY:

Theory Marks	- 50
IA marks for theory	- 10
Total No. of Teaching hr. per Sem.	- 60 hr.
Total No. of Teaching hr. per week	- 04 hr.
Duration of Theory Exam	- 03 hr.

PRATICAL:

Based on theory Paper – IV

Max. marks	- 40
Total No. of Practical's per week	- 01.
Duration of practical's	- 03hr.
Duration of Practical Examination	- 03 hr.

Unit-1

Definition of Seed, Differences between seed and grain, seed as a basic input and output in agriculture, role of high quality seeds in increasing crop production and seed quality concept. -10-hr

Unit-2

Agronomic principles of seed production (Temperature, Light, Humidity, Soil and Water management) -12-hr

Unit-3

Generation system and methods of production of nucleus, breeder, foundation and certified seeds. -08-hr

Unit-4

Detailed seed production procedure in following crops: Paddy, Maize, Ground nut, Tomato, Chick pea and Pigeon pea. - 09-hr

Unit-5

Seed Processing: Definition, concept, objective and advantages of Seed Processing, physical dimensions (Length, Width, Thickness, True Density, Bulk Density and Porosity), Seed Drying methods, advantages and disadvantages. -14-hr

Unit-6

Packaging and Marketing of Seeds: Bagger weigher, bag closing, labeling, lot number. Cost of packingRole of Seed Marketing agencies in India. -07-hr

B.Sc., SEED TECHONOLOGY

Model Question paper IV

Paper IV ( ) Q.P. Code -

SEED PRODUCTION AND PROCESSING

Max. Marks – 50

Time: - 03 hours

Instructions to candidates:

1) Answer all Questions

2) Draw the diagram wherever necessary

I Answer the following in a Word or A Sentence 6X1=6

1.
2.
3.
4.
5.
6.

II Short Answer Questions

Answer any Four of the following 4X3=12

7.
8.
9.
10.
11.
12.

III Medium Answer Questions 2X6=12

Answer any TWO of the following

13.
14.
15.
16.

IV Long Answer Questions 2X10=20

Answer any TWO of the following

17.
18.
19. Write short note on a)
b)

B.Sc., SEED TECHONOLOGY

Practical Syllabus

Paper-IV: SEED PRODUCTION AND SEED PROCESSING

Max. Marks – 40 Time: - 03 hours

Based on theory syllabus

1. Seed Bed Preparation and Sowing (Paddy/ cereals/ Vegetable seeds).
2. Exercise in field area (Field area measurement and field map preparation for seed production in experimental plot).
3. Field inspection techniques (Identification of weed plants, off types and other crop plants in seed production plots) .
4. Study of varietal purity through Dry seed examination, Physical purity determination.
5. Visit to seed processing unit and recording.
6. Seed Moisture determination by hot air oven and OSAW moisture meter method.
7. Filling the application form/label for seed bags
8. Solving any one or two heterogeneity problems .

B.Sc. SEED TECHNOLOGY

FOURTH SEMESTER

Paper IV ( ) Q.P. Code -

SEED PRODUCTION AND SEED PROCESSING

Max. Marks – 40

Time: - 03 hours

Q-I. Identify the specimens A, B & C sketch, label and give reasons. -09

Q-II. Fill the application form and comment D -05

Q-III. Perform an experiment on E (seed Purity/ Heterogenity/ Moisture determination) - 06

Q-IV. Identify F, G, H & I with reasons -10

Record -05

Viva -05