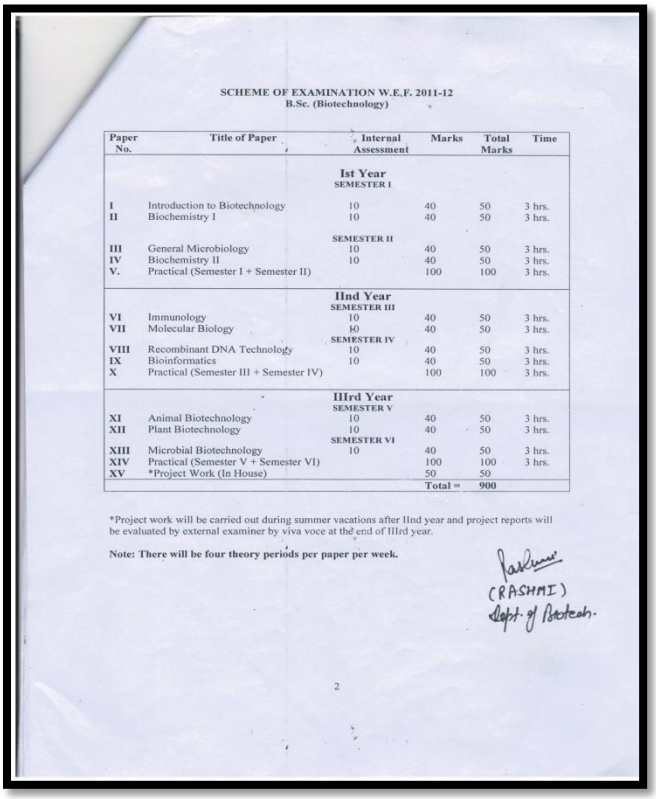
Courses that include experiential learning through project work/field work/internship during the year 2021-2022



SCHEME OF EXAMINATION W.E.F. 2011-12
B.Sc. (Biotechnology)

Paper No.	Title of Paper	Internal Assessment	Marks	Total Marks	Time
	Ist Year SEMESTER I				
I	Introduction to Biotechnology	10	40	50	3 hrs.
II	Biochemistry I	10	40	50	3 hrs.
	SEMESTER II				
III	General Microbiology	10	40	50	3 hrs.
IV	Biochemistry II	10	40	50	3 hrs.
V.	Practical (Semester I + Semester II)		100	100	3 hrs.
	IInd Year SEMESTER III				
VI	Immunology	10	40	50	3 hrs.
VII	Molecular Biology	10	40	50	3 hrs.
	SEMESTER IV				
VIII	Recombinant DNA Technology	10	40	50	3 hrs.
IX	Bioinformatics	10	40	50	3 hrs.
X	Practical (Semester III + Semester IV)		100	100	3 hrs.
	IIIrd Year SEMESTER V				
XI	Animal Biotechnology	10	40	50	3 hrs.
XII	Plant Biotechnology	10	40	50	3 hrs.
	SEMESTER VI				
XIII	Microbial Biotechnology	10	40	50	3 hrs.
XIV	Practical (Semester V + Semester VI)		100	100	3 hrs.
XV	*Project Work (In House)		50	50	
			Total =	900	

*Project work will be carried out during summer vacations after IInd year and project reports will be evaluated by external examiner by viva voce at the end of IIIrd year.

Note: There will be four theory periods per paper per week.

(RASHMI)
Deptt. of Biotech.

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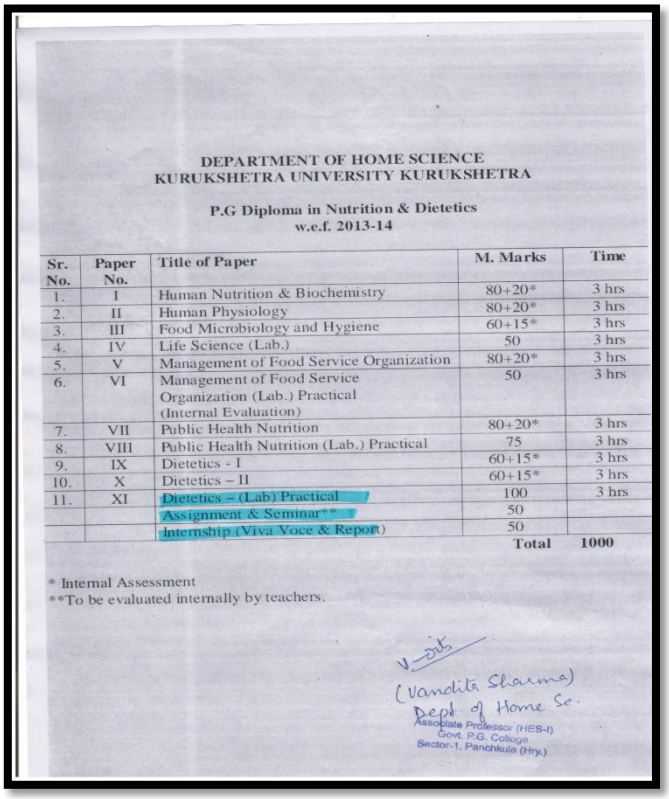
Biotechnology (B.Sc. II and III)



DEPARTMENT OF HOME SCIENCE
KURUKSHETRA UNIVERSITY KURUKSHETRA

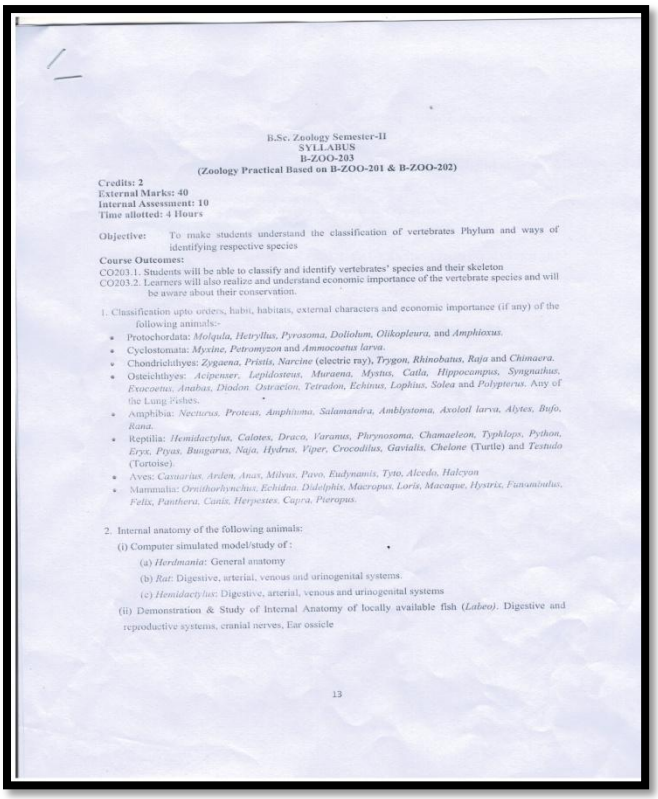
P.G Diploma in Nutrition & Dietetics
w.e.f. 2013-14

Sr. No.	Paper No.	Title of Paper	M. Marks	Time
1.	I	Human Nutrition & Biochemistry	80+20*	3 hrs
2.	II	Human Physiology	80+20*	3 hrs
3.	III	Food Microbiology and Hygiene	60+15*	3 hrs
4.	IV	Life Science (Lab.)	50	3 hrs
5.	V	Management of Food Service Organization	80+20*	3 hrs
6.	VI	Management of Food Service Organization (Lab.) Practical (Internal Evaluation)	50	3 hrs
7.	VII	Public Health Nutrition	80+20*	3 hrs
8.	VIII	Public Health Nutrition (Lab.) Practical	75	3 hrs
9.	IX	Dietetics - I	60+15*	3 hrs
10.	X	Dietetics – II	60+15*	3 hrs
11.	XI	Dietetics – (Lab) Practical	100	3 hrs
		Assignment & Seminar**	50	
		Internship (Viva Voce & Report)	50	
			Total	1000

* Internal Assessment
**To be evaluated internally by teachers.

(Vandita Sharma)
Dept. of Home Sc.
Associate Professor (HES-I)
Govt. P.G. College
Sector-1, Panchkula (Hry.)

Home Science (PGDND)



B.Sc. Zoology Semester-II
SYLLABUS
B-ZOO-203
(Zoology Practical Based on B-ZOO-201 & B-ZOO-202)

Credits: 2
External Marks: 40
Internal Assessment: 10
Time allotted: 4 Hours

Objective: To make students understand the classification of vertebrates Phylum and ways of identifying respective species

Course Outcomes:
CO203.1. Students will be able to classify and identify vertebrates' species and their skeleton
CO203.2. Learners will also realize and understand economic importance of the vertebrate species and will be aware about their conservation.

1. Classification upto orders, habit, habitats, external characters and economic importance (if any) of the following animals:-
   - Protochordata: *Molgula, Hetryllus, Pyrosoma, Doliolum, Oikopleura,* and *Amphioxus.*
   - Cyclostomata: *Myxine, Petromyzon* and *Ammocoetus larva.*
   - Chondrichthyes: *Zygaena, Pristis, Narcine* (electric ray), *Trygon, Rhinobatus, Raja* and *Chimaera.*
   - Osteichthyes: *Acipenser, Lepidosteus, Muraena, Mystus, Catla, Hippocampus, Syngnathus, Exocoetus, Anabas, Diodon. Ostracion, Tetradon, Echinus, Lophius, Solea* and *Polypterus.* Any of the Lung Fishes.
   - Amphibia: *Necturus, Proteus, Amphiuma, Salamandra, Amblystoma, Axoloti larva, Alytes, Bufo, Rana.*
   - Reptilia: *Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhlops, Python, Eryx, Ptyas, Bungarus, Naja, Hydrus, Viper, Crocodilus, Gavialis, Chelone* (Turtle) and *Testudo* (Tortoise).
   - Aves: *Casuarius, Arden, Anas, Milvus, Pavo, Eudynamis, Tyto, Alcedo, Halcyon.*
   - Mammalia: *Ornithorhynchus, Echidna. Didelphis, Macropus, Loris, Macaque, Hystrix, Funambulus, Felix, Panthera, Canis, Herpestes, Capra, Pteropus.*

2. Internal anatomy of the following animals:
   (i) Computer simulated model/study of :
   (a) *Herdmania*: General anatomy
   (b) *Rat*: Digestive, arterial, venous and urinogenital systems.
   (c) *Hemidactylus*: Digestive, arterial, venous and urinogenital systems
   (ii) Demonstration & Study of Internal Anatomy of locally available fish (*Labeo*). Digestive and reproductive systems, cranial nerves, Ear ossicle

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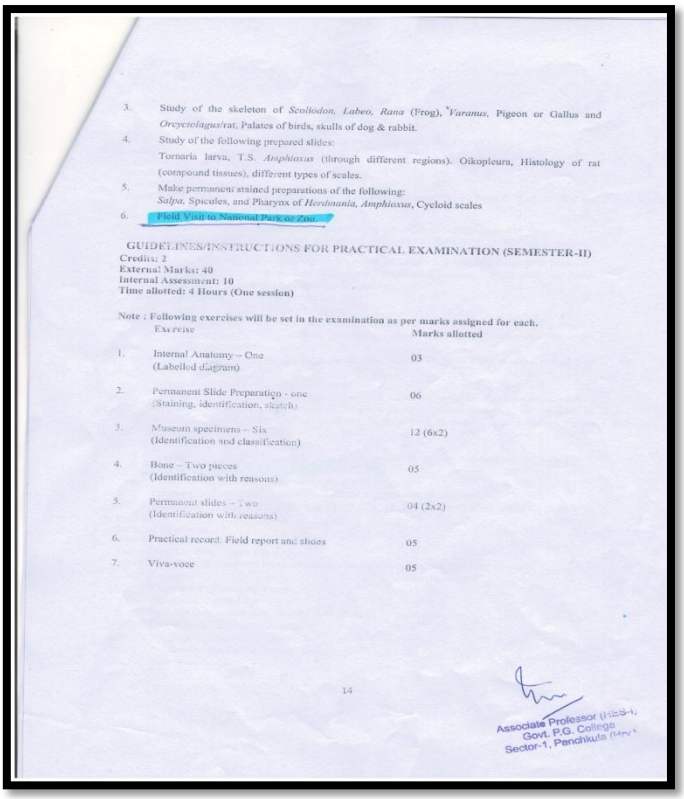
Zoology (B.Sc. I)



3. Study of the skeleton of *Scoliodon, Labeo, Rana* (Frog), *Varanus,* Pigeon or Gallus and *Oryctolagus*/rat, Palates of birds, skulls of dog & rabbit.
4. Study of the following prepared slides:
   Tornaria larva, T.S. *Amphioxus* (through different regions), Oikopleura, Histology of rat (compound tissues), different types of scales.
5. Make permanent stained preparations of the following:
   Salpa, Spicules, and Pharynx of *Herdmania, Amphioxus*, Cycloid scales
6. Field Visit to National Park or Zoo.

GUIDELINES/INSTRUCTIONS FOR PRACTICAL EXAMINATION (SEMESTER-II)
Credits: 2
External Marks: 40
Internal Assessment: 10
Time allotted: 4 Hours (One session)

Note : Following exercises will be set in the examination as per marks assigned for each.

Exercise	Marks allotted
1. Internal Anatomy – One (Labelled diagram)	03
2. Permanent Slide Preparation - one (Staining, identification, sketch)	06
3. Museum specimens – Six (Identification and classification)	12 (6x2)
4. Bone – Two pieces (Identification with reasons)	05
5. Permanent slides – Two (Identification with reasons)	04 (2x2)
6. Practical record, Field report and shoes	05
7. Viva-voce	05

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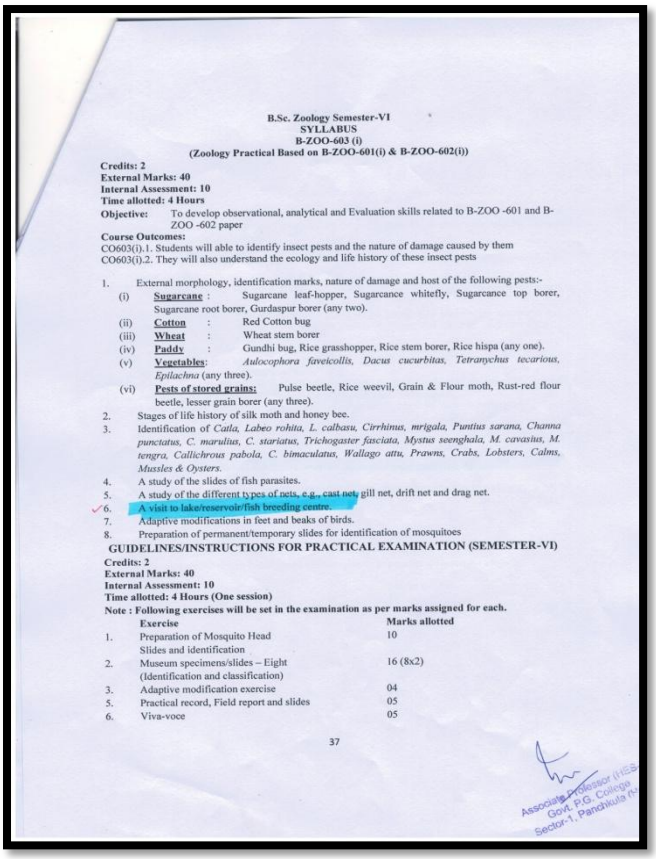
Associate Professor (HES-I)
Govt. P.G. College
Sector-1, Panchkula (Hry.)

Zoology (B.Sc. I)



B.Sc. Zoology Semester-VI
SYLLABUS
B-ZOO-603 (i)
(Zoology Practical Based on B-ZOO-601(i) & B-ZOO-602(i))

Credits: 2
External Marks: 40
Internal Assessment: 10
Time allotted: 4 Hours
Objective: To develop observational, analytical and Evaluation skills related to B-ZOO -601 and B-ZOO -602 paper

Course Outcomes:
CO603(i).1. Students will able to identify insect pests and the nature of damage caused by them
CO603(i).2. They will also understand the ecology and life history of these insect pests

1. External morphology, identification marks, nature of damage and host of the following pests:-
   (i) **Sugarcane** : Sugarcane leaf-hopper, Sugarcane whitefly, Sugarcane top borer, Sugarcane root borer, Gurdaspur borer (any two).
   (ii) **Cotton** : Red Cotton bug
   (iii) **Wheat** : Wheat stem borer
   (iv) **Paddy** : Gundhi bug, Rice grasshopper, Rice stem borer, Rice hispa (any one).
   (v) **Vegetables**: *Aulocophora faveicollis, Dacus cucurbitas, Tetranychus tecarious, Epilachna* (any three).
   (vi) **Pests of stored grains:** Pulse beetle, Rice weevil, Grain & Flour moth, Rust-red flour beetle, lesser grain borer (any three).
2. Stages of life history of silk moth and honey bee.
3. Identification of *Catla, Labeo rohita, L. calbasu, Cirrhinus, mrigala, Puntius sarana, Channa punctatus, C. marulius, C. stariatus, Trichogaster fasciata, Mystus seenghala, M. cavasius, M. tengra, Callichrous pabola, C. bimaculatus, Wallago attu, Prawns, Crabs, Lobsters, Calms, Mussles & Oysters.*
4. A study of the slides of fish parasites.
5. A study of the different types of nets, e.g., cast net, gill net, drift net and drag net.
6. A visit to lake/reservoir/fish breeding centre.
7. Adaptive modifications in feet and beaks of birds.
8. Preparation of permanent/temporary slides for identification of mosquitoes

GUIDELINES/INSTRUCTIONS FOR PRACTICAL EXAMINATION (SEMESTER-VI)

Credits: 2
External Marks: 40
Internal Assessment: 10
Time allotted: 4 Hours (One session)
Note : Following exercises will be set in the examination as per marks assigned for each.

	Exercise	Marks allotted
1.	Preparation of Mosquito Head Slides and identification	10
2.	Museum specimens/slides – Eight (Identification and classification)	16 (8x2)
3.	Adaptive modification exercise	04
5.	Practical record, Field report and slides	05
6.	Viva-voce	05

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Associate Professor (HES-I)
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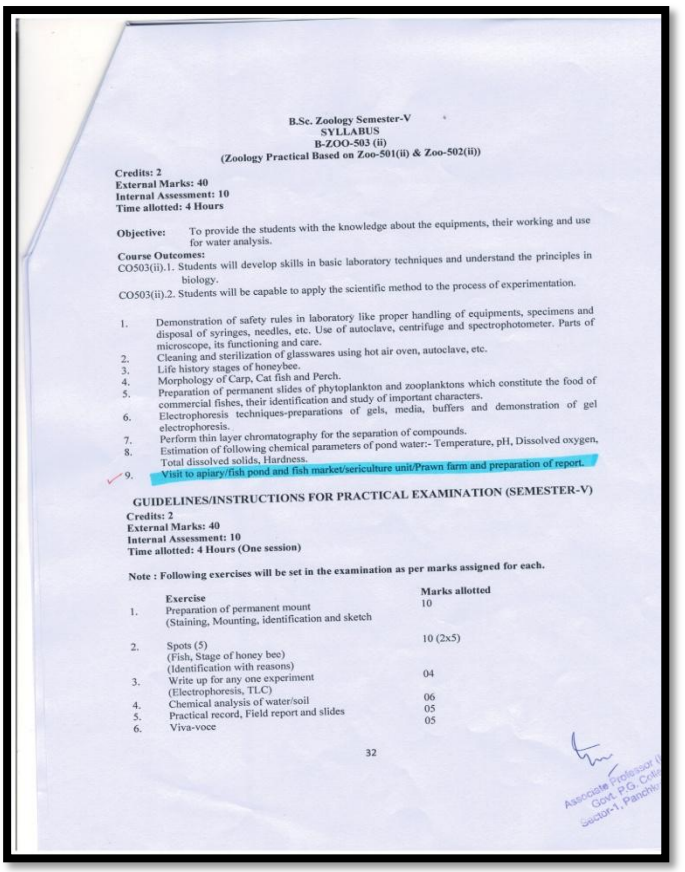
Sector-1, Panchkula (Hry.)

Zoology (B.Sc. II)



B.Sc. Zoology Semester-V
SYLLABUS
B-ZOO-503 (ii)
(Zoology Practical Based on Zoo-501(ii) & Zoo-502(ii))

Credits: 2
External Marks: 40
Internal Assessment: 10
Time allotted: 4 Hours

Objective: To provide the students with the knowledge about the equipments, their working and use for water analysis.

Course Outcomes:
CO503(ii).1. Students will develop skills in basic laboratory techniques and understand the principles in biology.
CO503(ii).2. Students will be capable to apply the scientific method to the process of experimentation.

1. Demonstration of safety rules in laboratory like proper handling of equipments, specimens and disposal of syringes, needles, etc. Use of autoclave, centrifuge and spectrophotometer. Parts of microscope, its functioning and care.
2. Cleaning and sterilization of glasswares using hot air oven, autoclave, etc.
3. Life history stages of honeybee.
4. Morphology of Carp, Cat fish and Perch.
5. Preparation of permanent slides of phytoplankton and zooplanktons which constitute the food of commercial fishes, their identification and study of important characters.
6. Electrophoresis techniques-preparations of gels, media, buffers and demonstration of gel electrophoresis.
7. Perform thin layer chromatography for the separation of compounds.
8. Estimation of following chemical parameters of pond water:- Temperature, pH, Dissolved oxygen, Total dissolved solids, Hardness.
9. Visit to apiary/fish pond and fish market/sericulture unit/Prawn farm and preparation of report.

GUIDELINES/INSTRUCTIONS FOR PRACTICAL EXAMINATION (SEMESTER-V)

Credits: 2
External Marks: 40
Internal Assessment: 10
Time allotted: 4 Hours (One session)

Note : Following exercises will be set in the examination as per marks assigned for each.

	Exercise	Marks allotted
1.	Preparation of permanent mount (Staining, Mounting, identification and sketch	10
2.	Spots (5) (Fish, Stage of honey bee) (Identification with reasons)	10 (2x5)
3.	Write up for any one experiment (Electrophoresis, TLC)	04
4.	Chemical analysis of water/soil	06
5.	Practical record, Field report and slides	05
6.	Viva-voce	05

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Associate Professor (HES-I)
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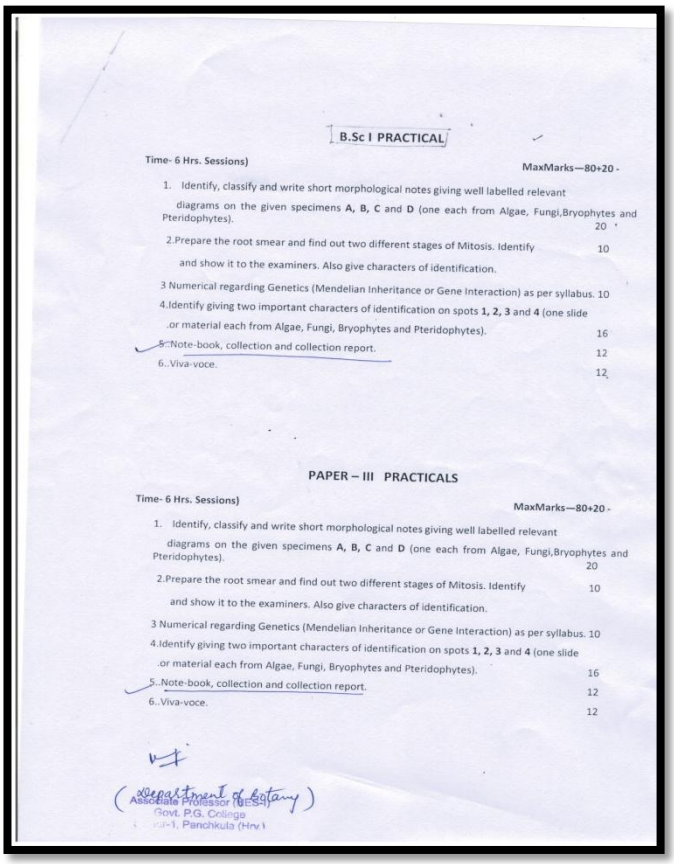
Zoology (B.Sc. III)



B.Sc I PRACTICAL

Time- 6 Hrs. Sessions) MaxMarks—80+20 -

1. Identify, classify and write short morphological notes giving well labelled relevant diagrams on the given specimens **A, B, C** and **D** (one each from Algae, Fungi,Bryophytes and Pteridophytes). 20
2. Prepare the root smear and find out two different stages of Mitosis. Identify and show it to the examiners. Also give characters of identification. 10
3. Numerical regarding Genetics (Mendelian Inheritance or Gene Interaction) as per syllabus. 10
4. Identify giving two important characters of identification on spots **1, 2, 3** and **4** (one slide or material each from Algae, Fungi, Bryophytes and Pteridophytes). 16
5. Note-book, collection and collection report. 12
6. Viva-voce. 12

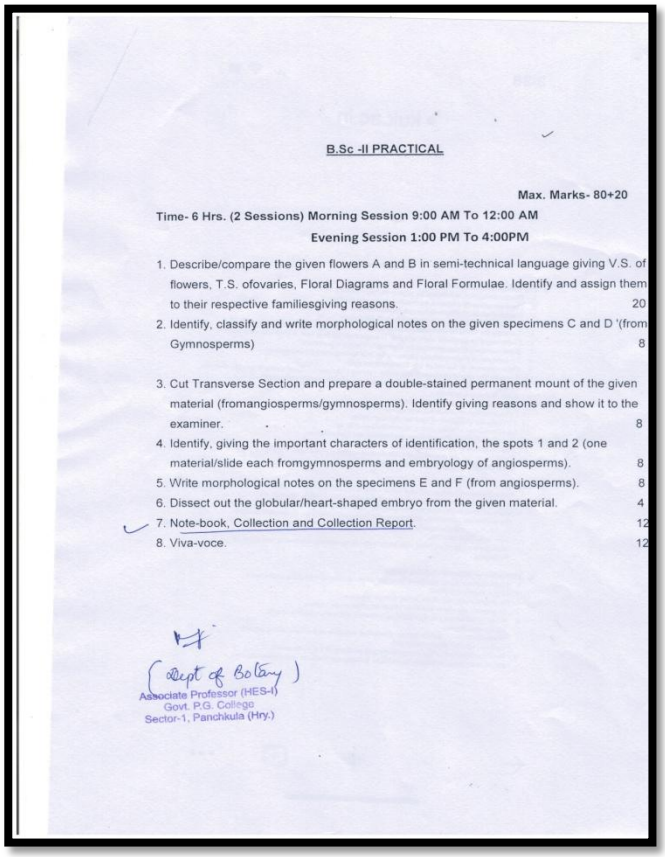
PAPER – III PRACTICALS

Time- 6 Hrs. Sessions) MaxMarks—80+20 -

1. Identify, classify and write short morphological notes giving well labelled relevant diagrams on the given specimens **A, B, C** and **D** (one each from Algae, Fungi,Bryophytes and Pteridophytes). 20
2. Prepare the root smear and find out two different stages of Mitosis. Identify and show it to the examiners. Also give characters of identification. 10
3. Numerical regarding Genetics (Mendelian Inheritance or Gene Interaction) as per syllabus. 10
4. Identify giving two important characters of identification on spots **1, 2, 3** and **4** (one slide or material each from Algae, Fungi, Bryophytes and Pteridophytes). 16
5. Note-book, collection and collection report. 12
6. Viva-voce. 12

(Department of Botany)
Associate Professor (HES-I)
Govt. P.G. College
Sector-1, Panchkula (Hry.)

Botany (B.Sc. I and III)



B.Sc -II PRACTICAL

Max. Marks- 80+20

Time- 6 Hrs. (2 Sessions) Morning Session 9:00 AM To 12:00 AM
Evening Session 1:00 PM To 4:00PM

1. Describe/compare the given flowers A and B in semi-technical language giving V.S. of flowers, T.S. ofovaries, Floral Diagrams and Floral Formulae. Identify and assign them to their respective familiesgiving reasons. 20
2. Identify, classify and write morphological notes on the given specimens C and D '(from Gymnosperms) 8
3. Cut Transverse Section and prepare a double-stained permanent mount of the given material (fromangiosperms/gymnosperms). Identify giving reasons and show it to the examiner. 8
4. Identify, giving the important characters of identification, the spots 1 and 2 (one material/slide each fromgymnosperms and embryology of angiosperms). 8
5. Write morphological notes on the specimens E and F (from angiosperms). 8
6. Dissect out the globular/heart-shaped embryo from the given material. 4
7. Note-book, Collection and Collection Report. 12
8. Viva-voce. 12

(Dept of Botany)
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Botany (B.Sc. II)