पं. रविशंकर शुक्ल विश्वविद्यालय रायपुर (छत्तीसगढ़) ायल विष्वति पाठ्यक्रम SYLLABUS FOR BSc I, BSc II and BSc III

PT. RAVISHANKAR SHUKLA UNIVERSITY RAIPUR (C.G.)

REVISED ORDINANCE NO. 21

BACHELOR OF SCIENCE

1. The three year course has been broken up into three Parts. Part-I known as B.Sc. Part-I examination at the end of the first year, Part-II known as B.Sc. Part-II examination at the end of the second year and Part-III known as B.Sc. Part-III examination at the end of the third year.

2. A candidate who after passing (10+2) Higher Secondary or Intermediate examination of C.G. Board of Secondary Education Bhopal or any other Examination recognised by the University or C.G. Board of Secondary Education as equivalent thereto, has attended a regular course of study in an affiliated College or in the Teaching Department of the University for one academic year shall be eligible for appearing at the B.Sc. Part-I examination.

3. A candidate who, after passing the B.Sc.-I examination of the University or any other examination recognised by the University as equivalent thereto, has attended a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-II examination.

4. A candidate who, after passing the B.Sc. Part-Ii examination of the University, has completed a regular course of study for one academic year in an affiliated college or in the Teaching Department of the University shall be eligible for appearing at the B.Sc. Part-III examination.

5. Besides regular students, subject to their compliance with this Ordinance ex-student and non-collegiate candidates shall be permitted to offer only such subjects/papers as are taught to the regular student at any of the University Teaching Department or College.

6. Every candidate appearing in B.Sc. Part-I, Part-II and Part-III examination shall be examined in -

(i) Foundation Course:

(ii) Any one of the following combinations of three subjects :-

- 1. Physics, Chemistry & Mathematics.
- 2. Chemistry, Botany & Zoology.
- 3. Chemistry, Physics & Geology.
- 4. Chemistry, Botany & Geology.
- 5. Chemistry, Zoology & Geology.
- 6. Geology, Physics & Mathematics.
- 7. Chemistry, Mathematics & Geology.
- 8. Chemistry, Botany & Defence Studies.
- 9. Chemistry, Zoology & Defence Studies
- 10. Physics, Mathematics & Defence Studies.
- 11. Chemistry, Geology & Defence Studies
- 12. Physics, Mathematics & Statistics
- 13. Physics, Chemistry & Statistics
- 14. Chemistry, Mathematics & Statistics.
- 15. Chemistry, Zoology & Anthropology.
- 16. Chemistry, Botany & Anthropology.
- 17. Chemistry, Geology & Anthropology.
- 18. Chemistry, Mathematics & Statistics.
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- 19. Chemistry, Anthropology & Defence Studies.
- 20. Geology, Mathematics & Statistics.
- 21. Mathematics, Defence Studies & Statistics
- 22. Anthropology, Mathematics & Statistics

- 23. Chemistry, Anthropology & Applied Statistics
- 24. Zoology, Botany & Anthropology
- 25. Physics, Mathematics & Electronics.
- 26. Physics, Mathematics & Computer Application
- 27. Chemistry, Mathematics & Computer Application
- 28. Chemistry, Bio-Chemistry & Pharmacy
- 29. Chemistry, Zoology & Fisheries.
- 30. Chemistry, Zoology & Agriculture
- 31. Chemistry, Zoology & Sericulture
- 32. Chemistry, Botany & Environmental Biology
- 33. Chemistry, Botany & Microbiology
- 34. Chemistry, Zoology & Microbiology
- 35. Chemistry, Industrial Chemistry & Mathematics
- 36. Chemistry, Industrial Chemistry & Zoology
- 37. Chemistry, Biochemistry, Botany
- 38. Chemistry, Biochemistry, Zoology
- 39. Chemistry, Biochemistry, Microbiology
- 40. Chemistry, Biotechnology, Botany
- 41. Chemistry, Biotechnology, Zoology
- 42. Geology, Chemistry & Geography
- 43. Geology, Mathematics & Geography
- 44. Mathematics, Physics & Geography
- 45. Chemistry, Botany & Geography

(iii) Practical in case prescribed for core subjects.

7. Any candidate who has passed the B.Sc. examination of the University shall be allowed to present himself for examination in any of the additional subjects prescribed for the B.Sc. examination and not taken by him at the degree examination. Such candidate will have to first appear and pass the B.Sc. Part-I examination in the subjects which he proposes to offer and then the B.Sc. Part-II and Part-III examination in the same subject. Successful candidates will be given a certificate to that effect.

8. In order to pass at any part of the three year degree course examination an examinee must obtain not less than 33% of the total marks in each subject/group of subjects. In subject/group of subjects where both theory and practical examination are provided an examinee must pass in both theory and practical parts of the examination separately.

9. Candidate will have to pass separately at the Part-I, Part-II and Part-III examinations. No division shall be assigned on the result of the Part-I and Part-II examination. In determining the division of the final examination, total marks obtained by the examinees in their Part-I, Part-II and Part-III examination in the aggregate shall be taken in to account. Provided in case of candidate who has passed the examination through supplementary examination having failed in one subject/ group only, the total aggregate marks being carried over for determining the division shall include actual marks obtained in the subject/ group in which he appeared at the supplementary examination.

D:\back\shital\Univ. Adhiniyam\RSU ORDINANCE\21 ORDINANCE 21.doc & 3 & 10. Successful examinee at the Part-III examination obtaining 60% or more marks shall be places in the First Division, those obtaining less than 60% but not less than 45% marks in the Second Division and other successful examinees in the Third Division.

ZOOLOGY

PAPER - I (paper code - 0813)

(CELL BIOLOGY & INVERTEBRATES)

MM-50

UNIT-1	The Cell (Prokaryotic & Eukaryotic)	
	Methods in cell biology (Microscopy light & Electron)	
	Organisation of cell extranuclear and nuclear (Plasma membrane,	
	mitochondria, chromosomes, ER. Golgi bodies, Ribosomes)	
UNIT-2	Cell divisions (Mitosis & Meiosis)	
	An elementary idea of cell transformation & Cancer Immunity (elementary	
	idea)	
UNIT-3	General Characteristics & Classification of invertabrates upto orders with	
	examples	
	Protozoa - type study Paramoecium, protozoa & disease	
	Porifera - type sutdy Sycon	
	Coelenterata - type sutdy Obelia	
UNIT-4	Helminths - type sutdy fasciola	
	Annelida - type sutdy Pheretima	
	Arthropoda - type sutdy Palaemon	
UNIT-5	Mollusca - type study Pila	
	Echinodermata- type study Asterias (starfish)	
	Protochordata - type sutdy Balanoglossus	

PAPER - II

(paper code - 0814)

(VERTEBRATES & EMBRYOLOGY)

M.M. 50

UNIT-1	Origin and classification of Chordates.
	Protochordata - type study Amphioxus.
	A comparative account of Petromyzon & Myxine
UNIT-2	Fishes - Skin and scales
	Migration in fishes
	Parental care
	Amphibia - Parental care
	Neoteny
	Reptilia - Poisonous & non poisonous shakes, Poison apparatus, snake
	venom.
UNIT-3	Aves - Flight adaptation in birds
	Discuss - Birds are glorified reptiles
	Mammals- comparative account of prototheria, metatheria & Eutheria
	and Affinities.
UNIT-4	Gametogenesis, Fertilization & Parhenogenesis.
	Development of frog upto formation of three germ layers
UNIT-5	Development of Chick up to formation of three germ layer, Extra
	embryonic membranes.
	Placenta in mammals.
	Embryonic induction organisers & differentiation.

PARACTICAL

M.M. 50

The practical work will, in general be based on the syllabus prescribed in theory and the Candidates will be required to show knowledge of the following.

1.	Dissection of earth worm.
2.	Dissection of Cockroach, Palaemon, Pila.
3.	Minor Dissection- Appendages of Prawn & hastate plate, Mouth-parts of Insects,
	Radula
	of Pila.
4.	Mounting-Setae, Spermatheca, Septal Nephridia, Nerve ring & ovary of earth
	worm/
	Parapodia of Nereis Salivary gland of Cockroach, ctenidium of pila, Malpighian
	tubules.
5.	Cytological preparation- Onion root-tip "Squash Preparation" for
	mitosis/Grasshopper testis, Squash for meiosis.
6.	Osteology-Frog & Rabbit
7.	Museum Specimen invertebrate & Vertebrate, frog embryology.
8.	Slides-Chick embryology, Cytology, Mammal Histology, Bird feather &
	invertebrate Slides.

Scheme of Practical Exam. Time 3 Hrs,

M.M. 50

1	Major Dissection	8 Marks
2	Minor Dissection	6 Marks
3	Mounting	5 Marks
4	Cytological Preparation	5 Marks
5	Spots- 8 (Slides-4, Specimens-2, &	16 Marks
	Bones-2)	
6	Sessional	10 Marks

BSc II

ZOOLOGY

PAPER - I

ANATOMY & PHYSIOLOGY M.M.: 50

(Paper Code - 0863)

Attempting one question from each unit will be compulsory. 100% choice will be given.

	Comparative Anatomy of various organ systems of vertebrates.
UNIT-I	1. Integument and its derivatives: structure of scales, hair and feathers.
	2. Alimentary canal and digestive glands in vertebrates.
	3. Respiratory Organs
	Gills and lung, Air-Sae in birds
UNIT-II	1. Endoskeleton-Limbs, girdles and vertebrae.
	2. Circulatory System - Evolution of heart and aortic arches.
	3. Urinogenital System - Kidney and excretory ducts.
UNIT-III	1. Nervous System - General plan of brain and spinal cord.
	2. Endocaine glands - classification and histology.
	3. Gonads and genital ducts.
UNIT-IV	1. Digestion and absorption of dietary components.
	2. Physiology of heart, Cardiac cycle and ECG.
	3. Blood Coagulation.
	4. Respiration-Mechanism and control of breathing.
UNIT-V	1. Excretion-Physiology of excretion, Osmoregulation.
	2. Physiology of Muscle contraction.
	3. Physiology of nerve impulse, Synaptic transmission.
	4. Ear and Eye - structure and function.

BSc II			
ZOOLOGY PAPER - II			
VERTE	VERTEBRATE ENDOCRINOLOGY, REPRODUCTIVE BIOLOGY BEHAVIOUR,		
	EVOLUTION AND APPLIED ZOOLOGY		
	(Paper Code - 0864)		
UNIT-I	1. General Characters of Hormones.		
	2. Hormone Receptor		
	3. Biosynthesis and secretion of thyroid, Adrnal; Ovarian and testicular		
	hormones.		
	4. Endocrine disorder due to hormones and other gland.		
UNIT-II	1. Reproductive cycle in vertebrate.		
	2. Menustration, Lactation and pregnancy.		
	3. Mechanism of parturition.		
	4. Hormonal regulation of gametogenesis.		
	5. Extra embryonic membrane		
UNIT-III	1. Evidences of organic evolution.		
	2. Theories of organic evolution.		
	3. Variation, Mutation, Isolation and Natural selection.		
	4. Evolution of Horse.		
UNIT-IV	1. Introduction to Ethology.		
	2. Patterns of Behaviour Taxes, Rellexes, Drives and Stereotyped Behaviour.		
	3. Reproductive Behavioural Patterns.		
	4. Hormones, Drugs and Behaviour.		
UNIT-V	1. Aquaculture		
	2. Sericultural		
	3. Apiculture		
	4. Pisciculture		
	5. Poultry keeping		
	6. Elements of Pest Control -		
	1. Chemical control		
	2. Biological Control		

PARACTICAL WORK

M.M. 50

The practical work in general shall be based on the syllabus prescribed in theory. The students will be required to show the knowledge of the following.

1.	Study of the representative examples of the different chordates (Classification and
	character)
2.	Dissection of various systems of scoliodon-Afferent and Efferent branchial
	vessels, cranial nerves, internal ear.
3.	Simple microscopic technique through unstained or stained permanent mounts.
4.	Study of prepared slides histological, as per theory papers.
5.	Study of limb girdles and vertebrae of frog, varanus, fowl and Rabbit.
6.	Identification of species and individuals of honey bee.
7.	Life cycle of honey bee and silkworm.

Scheme of Practical Exam. Time 3 Hrs,

M.M. 50

1	Major Dissection (Cranial nerves/Efferent branchial vessel)	12 Marks
2	Minor Dissection (Afferent branchial/Internal ear)	8 Marks
3	Permanent mount	09 Marks
4	Cytological Preparation	5 Marks
5	Spots- 8 (Slides-4, Specimens-2, & Bones-2)	16 Marks
6	Viva-voce	05 Marks
7	Sessional	05 Marks

B.Sc.-III

Paper-I (Paper Code-0917)

(Ecology, Environmental-biology; Toxicology ; Microbiology and Medical Zoology) Note: Attempting one question from each unit will be compulsory, 100% choice will be

given. Unit-I 1. Aims and scopes of Ecology 2. Major ecosystems of the world-Brief introduction (Ecology) Population- Characteristics and regulation of densities. 3. Communities and Ecosystems. 4. Biogeochemical cycles 5. Air and water pollution 6. Ecological succession Unit -II 1. Laws of limiting factors (Environmental biology) 2. Food chain in a freshwater ecosystem. 3. Energy flow in ecosystem-Trophic levels 4. Conservation of Natural resources 5. Environmental impact Assessment Unit -III 1. Definition of Toxicity (Toxicology) 2. Classification of toxicants 3. Principle of systematic toxicology 4. Toxic agents and their action- Metallic and inorganic agents 5. Animal poisons - Snake-venom, Scorpion and bee poisoning 6. Food pisoning Unit -IV 1. General and Applied microbiology. (Microbiology) 2. Microbiology of Domestic water and sewage 3. Microbiology of milk and milk products 4. Industrial microbiology

Unit -V	1. Brief introduction to pathogenic micro-organisurs,
(Medical microbiology)	Rickettsia, Spirochaetes and Bacteria.
	2. Brief account of life-history and pathogenicity of the
	following pathogens with reference to man ; Prophylaxis and
	treatment - (a) Pathogenic Protozoans - Entamoeba,
	Trypanosoma, and Giardia (b) Pathogenic helminths -
	Schistosoma (c) Nematode Pathogenic parasites of man
	3. Vector insects

B.Sc.-III

PAPER-II (Paper Code-0918)

(Genetic's, Cell Physiology, Biochemistry, Biotechnology And Biotechniques)

Note: Attempting one question from each unit will be compulsory, 100% choice will be

given.

Unit-I	1. Linkage and Linkage maps		
(Genetic's)	2. Varieties of gene expression - Multiple alleles; lithogenesis ;		
	Pleiotropic genes; gene interaction ; epistasis.		
	3. Sexchromosome systems, and sex-linkage.		
	4. Mutation and chromosomal alterations; meiotic consequences.		
	Human genetics - chromosomal and single gene disorders (somatic		
	cell genetics)		
Unit-II (Cell	1. General idea about pH and Buffer.		
Physiology)	2. Transport across membrane - cell membrane; Mitochondria and		
	Endoplasmic reticulum.		
	3. Active transport and its mechanism; Active transport in Mitochondria		
	and Endoplasmic reticulum.		
	4. Hydrolytic enzymes - Their chemical nature, Activation and		
	specificity.		
Unit-III	1. Amino acids and Peptides - Basic structure and biological function.		
(Biochemistry)	2. Carbohydrate and its metabolism - Glycogenesis; Gluconeogenesis;		
	glycolysis,		
	Glycogenolysis; Cosi-cycle.		
	3. Lipid metabolism - Oxidation of glycerol; oxidation of fatty acid.		
	4. Protein metabolism - Deamination, Transamination, Transmethylation;		
	Biosynthesis of Protein		
Unit-IV	1. Biotechnology - Scope and importance.		
(Biotechnology)	2. Recombinant DNA and Gene cloning.		
	3. Cloned genes and other tools of biotechnology.		
	4. Applications of biotechnology in (i) Pharmaceutical industry, and (ii)		

	Food processing industry.	
Unit-V	Principles and techniques about the following	
(Biotechnique)	1. pH meter	
	2. Colorimeter	
	3. Microscopy-Light microscopes, Phase contrast and Electron	
	microscopes.	
	4. Centrifugation	
	5. Separation of biomolecules by chromatography, and Electrophoresis	
	6. Histrochemical methods for determination of Protein, Lipids, and	
	carbohydrate	

B.Sc.-III (31)

PRACTICAL WORK

The Practical work in general shall be based on syllabus prescribed in theory.

The candidates will be required to show knowledge of the following:

- 1. Estimation of population density, Percentage frequency, Relative density.
- 2. Analysis of Producers and consumers in grassland.
- 3. Detection of gram-negative and gram-positive bacteria.
- 4. Blood group detection (A, B, AB & O).
- 5. R.B.C., W.B.C. count.
- 6. Blood coagulation time.
- 7. Preparation of Hematin crystals from blood of rat.
- 8. Observation of Drosophila, wild and mutant.
- 9. Chromatography-Paper or gel.
- 10. Colorimetric estimation of hemoglobin.
- 11. Mitosis in onion root tip.
- 12. Biochemical detection of Carbohydrate, Protein and Lipid.
- 13 Study of Permanent slides of Parasites, based on theory paper.
- 14 Working Principles of pH meter, Colorimeter, centrifuge and microscopes.

01	Haematological Experiment	: 08 marks
	R.B.Cs./W.B.Cs. Counting/Blood group detection	
02	Ecological Experiment	: 06 marks
	Estimation of Population Density/Frequency/relative Density	
03	Staining of Gram +ve and Gram -ve Bacteria/cytological	: 05 marks
	experiment : Mitosis in onion root tip	
04	Biochemical Experiment :	: 06 marks
	(biochemical detection of carbohydrate/protein lipid)	
05	Chromatography	: 05 marks
06	Spotting :	: 10 marks
	Study of permanent slides of Parasites : 3	
	Comments on working Principles of pH meter /	
	Calorimeter / centrifuge and Microscope :	
07	Viva Voce	: 05 marks
08	Sessional	: 05 marks

SCHEDULE FOR PRACTICAL EXAMINATION Duration : 4 Hrs. Max Marks : 50