MODIFIED CBCS CURRICULUM OF

ZOOLOGY HONOURS PROGRAMME

SUBJECT CODE = 57

FOR UNDER GRADUATE COURSES UNDER RANCHI UNIVERSITY

Implemented from

Academic Session 2017-2020 & 2018-2021

COURSES OF STUDY FOR **GENERIC ELECTIVE 'B. Sc. Hons'** PROGRAMME IN

"ZOOLOGY"

SEMESTER I **GENERIC ELECTIVE** **1 Paper**

Total 100 x 1 = 100 Marks

I. GENERIC ELECTIVE (GE 1): (Credits: Theory-04, Practicals-02)

- All Four Generic Papers (One paper to be studied in each semester) of Botany to be studied by the Students of **Other than Zoology Honours.**
- Students of **Zoology Honours** must Refer Content from the **Syllabus of Opted Generic Elective Subject**.

Marks : 75 (ESE: 3Hrs) + 25 (Pr 3Hrs)=100	**Pass Marks: Th ESE = 30 + Pr ESE =10**

Instruction to Question Setter for

End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

ANIMAL DIVERSITY **Theory: 60 Lectures**

Unit 1: Kingdom Protista
General characters and classification up to classes; Locomotory Organelles and locomotion in Protozoa

Unit 2: Phylum Porifera
General characters and classification up to classes; Canal System in Sycon 3

Unit 3: Phylum Cnidaria
General characters and classification up to classes; Polymorphism in Hydrozoa

Unit 4: Phylum Platyhelminthes
General characters and classification up to classes; Life history of Taeniasolium

Unit 5: Phylum Nemathelminthes
General characters and classification up to classes; Life history of Ascarislumbricoides and its parasitic adaptations

Unit 6: Phylum Annelida
General characters and classification up to classes; Metamerism in Annelida

Unit 7: Phylum Arthropoda
General characters and classification up to classes; Vision in Arthropoda, Metamorphosis in Insects

Unit 8: Phylum Mollusca
General characters and classification up to classes; Torsion in gastropods

Unit 9: Phylum Echinodermata
General characters and classification up to classes; Water-vascular system in Asteroidea

Unit 10: Protochordates
General features and Phylogeny of Protochordata

Unit 11: Agnatha
General features of Agnatha and classification of cyclostomes up to classes

Unit 12: Pisces
General features and Classification up to orders; Osmoregulation in Fishes

Unit 13: Amphibia
General features and Classification up to orders; Parental care

Unit 14: Reptiles
General features and Classification up to orders; Poisonous and non-poisonous snakes, Biting mechanism in snakes

Unit 15: Aves
General features and Classification up to orders; Flight adaptations in birds

Unit 16: Mammals
Classification up to orders; Origin of mammals

GE 1 LAB: ANIMAL DIVERSITY **60 Lectures**

1. Study of the following specimens:
   Amoeba, Euglena, Plasmodium, Paramecium, Sycon, Hyalonema, and Euplectella, Obelia, Physalia, Aurelia, Tubipora, Metridium, Taeniasolium, Male and female Ascaris lumbricoides, Aphrodite, Nereis, Pheretima, Hirudinaria, Palaemon, Cancer, Limulus, Palamnaeus, Scolopendra, Julus, Periplaneta, Apis, Chiton, Dentalium, Pila, Unio, Loligo, Sepia, Octopus, Pentaceros, Ophiura, Echinus, Cucumaria and Antedon, Balanoglossus, Herdmania, Branchiostoma, Petromyzon, Sphyrna, Pristis, Torpedo, Labeo, Exocoetus, Anguilla, Ichthyophis/Ureotyphlus, Salamandra, Bufo, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Crocodylus, Gavialis, Any six common birds from different orders, Sorex, Bat, Funambulus, Loris

2. Study of the following permanent slides:
   T.S. and L.S. of Sycon, Study of life history stages of Taenia, T.S. of Male and female Ascaris

3. Key for Identification of poisonous and non-poisonous snakes

Suggested Readings:

- Ruppert and Barnes, R.D. (2006). Invertebrate Zoology, VIII Edition. Holt Saunders International Edition.
- Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). The
- Invertebrates: A New Synthesis, III Edition, Blackwell Science
- Young, J. Z. (2004). The Life of Vertebrates. III Edition. Oxford university press.
- Pough H. Vertebrate life, VIII Edition, Pearson International.
- Hall B.K. and Hallgrimsson B. (2008). Strickberger's Evolution. IV Edition. Jones and Bartlett Publishers Inc.
- Pechnek, J.A.2000. Biology of Invertebrates. Tata McGraw-Hill Publishing Company, New Delhi.
- Kardong, K.V.2002. Vertebrates. Tata McGraw-Hill Publishing Company, New Delhi.

SEMESTER II **GENERIC ELECTIVE** **1 Paper**

Total 100 x 1 = 100 Marks

II. GENERIC ELECTIVE (GE 2) (Credits: Theory-04, Practicals-02)

Marks : 75 (ESE: 3Hrs) + 25 (Pr 3Hrs)=100	Pass Marks: Th ESE = 30 + Pr ESE =10

Instruction to Question Setter for

End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

HUMAN PHYSIOLOGY **Theory: 60 Lectures**

Unit I: Digestion and Absorption of Food
Structure and function of digestive glands; Digestion and absorption of carbohydrates, fats and proteins; Nervous and hormonal control of digestion (in brief)

Unit II: Functioning of Excitable Tissue (Nerve and Muscle)
Structure of neuron, Propagation of nerve impulse (myelinated and non-myelinated nerve fibre); Structure of skeletal muscle, Mechanism of muscle contraction (Sliding filament theory), Neuromuscular junction

Unit III: Respiratory Physiology
Ventilation, External and internal Respiration, Transport of oxygen and carbon dioxide in blood, Factors affecting transport of gases.

Unit IV: Renal Physiology
Functional anatomy of kidney, Mechanism and regulation of urine formation,

Unit V: Cardiovascular Physiology
Structure of heart, Coordination of heartbeat, Cardiac cycle, ECG

Unit VI: Endocrine and Reproductive Physiology
Structure and function of endocrine glands (pituitary, thyroid, parathyroid, pancreas, adrenal, ovaries, and testes), Brief account of spermatogenesis and oogenesis, Menstrual cycle

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GE 2 LAB: HUMAN PHYSIOLOGY **60 Lectures**

1. Preparation of temporary mounts: Neurons and Blood film.
2. Preparation of haemin and haemochromogen crystals.
3. Estimation of haemoglobin using sahli's haemoglobinometer.
4. Examination of permanent histological sections of mammalian oesophagus, stomach, duodenum, rectum, lung, kidney, thyroid, pancreas, adrenal, testis, ovary.

Suggested Readings:

- Tortora, G.J. and Derrickson, B.H. (2009) Principles of Anatomy and Physiology, XII Edition, Jhon Wiley and Sons, Inc.
- Widmaier, E.P., Raff, H. and Strang, K.T. (2008). Vander's Human Physiology, XI Edition, McGraw Hill.
- Guyton, A.C. and Hall, J.E. (2011). Textbook of Medical Physiology, XII Edition, Harcourt Asia Pvt. Ltd/W.B. Saunders Company.
- Marieb, E. (1998). Human Anatomy and Physiology, IV Edition, Addison-Wesley.
- Kesar, S. and Vashisht, N. (2007). Experimental Physiology, Heritage Publishers.
- Prakash, G. (2012). Lab Manual on Blood Analysis and Medical Diagnostic, S. Chand and Company Ltd.

SEMESTER III **GENERIC ELECTIVE** **1 Paper**

Total 100 x 1 = 100 Marks

III. GENERIC ELECTIVE (GE 3)

(Credits: Theory-04, Practicals-02)

Marks : 75 (ESE: 3Hrs) + 25 (Pr 3Hrs)=100	Pass Marks: Th ESE = 30 + Pr ESE =10

Instruction to Question Setter for

End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

FOOD, NUTRITION & HEALTH

Theory: 60 Lectures

Unit 1: Basic concept of food and nutrition

Unit 2: Functions of food Components of food-nutrients (Macro and micronutrients): their biochemical role and dietary sources. Food groups and the concept of a balanced diet.

Causes of food spoilage; Food adulteration Nutrition through the life cycle- Physiological considerations, nutrient needs and dietary pattern for various groups- adults, pregnant and nursing mothers, infants, preschool and school children, adolescents and elderly.

Unit 3: Nutritional Biochemistry Carbohydrates, Lipids, Proteins - Definition, Classification, Structure and properties Significance of acid value, iodine value and saponification value of lipids; Essential and Non-essential amino acids; Enzymes- Definition, Classification, Properties; Coenzymes

Vitamins- Fat-soluble and Water-soluble vitamins; their Structure and properties Minerals- Iron, calcium, phosphorus, iodine, selenium and zinc: their properties

Unit 4: Health Introduction to health- Definition and concept of health; Major nutritional deficiency diseases- Protein Energy Malnutrition, Vitamin A deficiency, Iron deficiency anaemia, Iodine deficiency disorders, their causes, symptoms, treatment, prevention and government programmes, if any.

Life style related diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention through dietary/lifestyle modifications. Social health problems- smoking, alcoholism, drug dependence and Acquired Immuno Deficiency Syndrome (AIDS); Common ailments- cold, cough, fevers, diarrhoea, constipation- their causes and dietary treatment

Unit 5: Food hygiene, Potable water- sources and methods of purification, Food and Water borne infections

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GE 3 LAB: FOOD, NUTRITION & HEALTH **60 Lectures**

1. To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric
2. To determine absorbed oil content in fried foods
3. Estimation of lactose in milk
4. Ascorbic acid estimation in food by titrimetry
5. Estimation of calcium in foods by titrimetry
6. Preparation of temporary mounts of various stored grain pests
7. Project- Undertake computer aided diet analysis and nutrition counselling for different age groups. OR Identify nutrient rich sources of foods, their seasonal availability and price; study of nutrition labelling on selected foods.

Suggested Readings:

- Fifth Ed; 2007; New Age International Publishers
- Srilakshmi B. Nutrition Science; 2002; New Age International (P) Ltd.
- Srilakshmi B. Food Science; Fourth Ed; 2007; New Age International (P) Ltd.
- Swaminathan M. Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO.
- Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; 2009; Oxford & IBH Publishing Co. Pvt Ltd.
- Wardlaw GM, Hampl JS. Perspectives in Nutrition; Seventh Ed; 2007; McGraw Hill.
- Lakra P, Singh MD. Textbook of Nutrition and Health; First Ed; 2008; Academic Excellence.
- Manay MS, Shadaksharaswamy. Food-Facts and Principles; 1998; New Age International (P) Ltd.
- Jain P et al. Poshan va swasthya ke mool siddhant (Hindi); First Ed; 2007; Acadamic Pratibha.
- Gibney et al. Public Health Nutrition; 2004; Blackwell Publishing.
- Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). Biochemistry. VI Edition. W.H. Freeman and Co.

SEMESTER IV **GENERIC ELECTIVE** **1 Paper**

Total 100 x 1 = 100 Marks

IV. GENERIC ELECTIVE (GE 4))

(Credits: Theory-04, Practicals-02)

Marks : 75 (ESE: 3Hrs) + 25 (Pr 3Hrs)=100	Pass Marks: Th ESE = 30 + Pr ESE =10

Instruction to Question Setter for
End Semester Examination (ESE):

*There will be **two** group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.*

***Note:** There may be subdivisions in each question asked in Theory Examinations.*

ENVIRONMENT & PUBLIC HEALTH

Theory: 60 Lectures

Unit I: Introduction
Sources of Environmental hazards, hazards identification and accounting, fate of toxic and persistent substances in the environment, dose Response Evaluation, exposure Assessment.

Unit II: Climate Change
Greenhouse gases and global warming, acid rain, Ozone layer destruction, Effect of climate change on public health

Unit III: Pollution
Air, Water, Noise pollution sources and effects, Pollution control

Unit IV: Waste Management Technologies
Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, Biomedical waste handling and disposal, Nuclear waste handling and disposal, waste from thermal power plants, Case histories on Bhopal gas tragedy, Chernobyl disaster, Seveso disaster and three mile island accident and their aftermath.

Unit V: Diseases
Causes, Symptoms and control of tuberculosis, Asthma, Cholera, Minamata disease, typhoid

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GE 4 LAB: ENVIRONMENT & PUBLIC HEALTH

60 Lectures

To determine pH, CI, SO_4, NO_3 in soil and water samples from different locations

Suggested Readings:

- Cutter, S.L., Environmental Risk and Hazards, Prentice- Hall of India Pvt.Ltd. New Delhi, 1999.
- Kolluru Rao, Bartell Steven, Pitblado R and Stricoff "Risk Assessment and Management Handbook", Mc Graw Hill Inc., New York, 1996.
- Kofi Asante Duah "Risk Assessment in Environmental Management", Jhon Wiley and sons, Singapore, 1998.
- Kasperson, J.X. and Kasperson, R.E. and Kasperson, R.E., Global Environmental Risks, V.N. Univ. Press, New York, 2003.
- Joshep F Louvar and B Diane Louver Health and Environmental Risk Ansalysis fundamentals with applications, Prentice Hall, New Jersey 1997.
