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OFFICE OF THE DEAN, ACADEMIC AFFAIRS
ADIKAVI NANNAYA UNIVERSITY
 RAJAMAHENDRAVARAM

Prof. No. ANUR/Pre-Ph.D./Syllabi/2020/T2/12

Date: 18-09-2020

PROCEEDINGS OF THE VICE-CHANCELLOR

Sub:- ANUR- AA - Pre-Ph.D – Zoology – Syllabi, Model Question Papers and List of Paper Setters/Evaluators – Approved – Orders –Issued.

Ref :- Lr. No. Nil, dated 05-09-2020 of Dr. A. Matta Reddy, Research Supervisor and Chairman, BoS

Read:- Note orders of the Vice-Chancellor dated 17-09-2020

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ORDERS

With reference to the subject, having considered the Departmental Research Committee recommended syllabi of Zoology, the Vice-Chancellor has approved the Pre-Ph.D. Syllabus, Model Question Papers, Paper Setters/Evaluators for the Research Scholars of the Department as given below.

| S.No. | Name of the Research Scholar | Paper -I | Paper -II (Student concerned Research Specialization) |
|-------|------------------------------|--|---|
| 1 | Mr. Darapu Narasimha Rao | Recent Advances in Life Science & Research Methodology | Biogeochemistry & Research Methodology |

The fact be reported to the Academic Senate/Executive Council for ratification.

(BY ORDER)


 Academic Affairs

To
 The Head, Zoology - With a request to circulate the concerned Research Scholar
 The Special Officer (Confidential)
 The Dean, Examination
 The Controller of Examination
 The Convener, Board of Research Studies

Copies to
 The Principal, UCST for information
 PS to VC, PA to R, EC Item, OOF
 Webmaster for uploading of the syllabi and model papers

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
SCHOOL OF LIFE AND HEALTH SCIENCES
Pre Ph.D Examination Syllabus-2020

Paper - I: Recent Advances in Life Science & Research Methodology

UNIT-I:

Basic and applied research, Literature survey and collection, Identification of the problem, Setting up of objectives, Experimental design, standardization of protocols, Annual report preparation. Thesis writing, Research paper and Review article writing, Project writing.

UNIT-II:

Biochemical techniques: Extraction, isolation, purification, Identification and characterization of Proteins, Quantification of carbohydrates, Extraction of lipids, Enzyme kinetics – Enzymes assay, activity, turn over, yield. Measurement of pH: Use of indicators, Sterilization techniques, Media Preparation. Centrifugation techniques - Principle and applications of Centrifugation.

UNIT-III:

Microscopy – Principle, types, and applications of Microscopy,
Chromatography - Principle, types, and applications of Chromatography
Electrophoresis – Principle, types and applications of electrophoretic techniques
Isotopes – Scintillation counter, Gamma ray counter, Radioactive decay, Measurement and Units of radioactivity, safety measurements, Disposal of radioactive wastes.

UNIT-IV:

Spectrophotometry – Principles and applications of Visible, UV spectrophotometry, IR, NMR, AAS
Biostatistics – Sampling methods, Sample collection, Mean, Median, Mode, Tabulation of data, Graphical representation of data, correlation, regression, Chi-square test, Student t-test, Test of significance, ANOVA Software used in Biostatics.

UNIT-V:

Computational Biology-Microsoft office-word, excel and power point presentation, Graphical representation of data using EXCEL and sigma plot.
Bioinformatics –BLAST, Protein data base.
Intellectual property rights (IPR), property rights (IPP) and Patenting.

Texts and References:

1. Research methodology of biological science – by N. Gurumani
2. Fundamentals of Biostatistics – by Khan & Khanum
3. Biophysical chemistry: principles and techniques– by Upadhyay
4. An Introduction to Practical Biochemistry by Keith Wilson and John Walker
5. Molecular Cloning: A laboratory Manual by Joseph Sambrook and David W. Russell
Published by Cold Spring Harbor Laboratories Press

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ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
SCHOOL OF LIFE AND HEALTH SCIENCES
Pre Ph.D Examination Syllabus-2020
Paper – II: Biogeochemistry & Research Methodology

UNIT - I

General features of ocean waters: Salinity, temperature, Density, Transparency, tides, dissolved nutrients. Importance of open ocean ecosystem. Sampling strategies in aquatic system: Collection of samples, analysis of physical, chemical, and biological parameters. Analysis and preservation of dissolved nutrients Marquet's Principle. Conservative and Nonconservative behaviour of major and minor elements. Residence Time – its computation, variability and importance.

UNIT-II

Micronutrient elements – N, P and Si – their budgets and cycles. Nitrogen imbalance and denitrification. Trace metals (Cu, Zn, Co, Ni, V, Cr, Mo, Sn, Mn, Fe and Cd) – their origin, distribution and fate. Water Mass identification using T-S diagrams, PO and NO plots. Inter – element relationships and ratios.

UNIT- III

DON Concentrations in aquatic environments, composition of DON pool, sources, sinks of DON. DON importance to PP in aquatic systems. Elementary principles only of biological oceanography primary productivity and factors affecting it.

UNIT-IV


Dissolved Organic Matter and Particulate Organic Matter. Their Origin, Elemental and chemical composition, distribution and fate. Ectocrines. Extra cellular Metabolites and humic substances. Inputs, formation and fate of suspended particles. Morphology and composition. Stokes law of falling particles and its application in the sea. Degradation of organic matter under aerobic and anaerobic conditions.

UNIT-V

IRMS (Isotopic Ratio Mass Spectrometer) principle, instrumentation and its applications to measure C^{13} , N^{15} isotopic composition. TOC/TN Analyser, principle, instrumentation, their application in determination of Dissolved Organic Nitrogen in sea water.

Text Book References:

- 1) The oceans : Their Physics, Chemistry and General Biology, by H U Sverdup, M.W. Johnson, and R.H.Fleming, Asia Publishing House, Bombay, 1961
- 2) Principles of stable isotope geochemistry 2nd edition by Zachary Sharp.
- 3) Chemical Oceanography, by J.P.Riley and G.Skirrow (Editors), 2nd Edition Vols. 1 And 2, Academic Press London. 1975 Relevant Chapters (6,7,8,9,11,12,13,14,18, 37).


 Dr.A Matta Reddy
 Research Supervisor
 and BOS Chairman

el papers:

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
School of Life and Health Sciences
Pre-PhD Examinations 2020

Model paper for Paper- I: Recent Advances in Life Science & Research Methodology

Duration: 3 hour

Max Marks: 100M

ALL Questions carry equal marks

5X20=100M

Answer any FIVE of the following eight questions

UNIT-I

- 1) Write about experimental design and standardization of protocols for research work. Add a note on identification of research problem?
(or)
- 2) Write briefly about the thesis writing and Project writing?

UNIT-II

- 3) Differentiate disinfection and sterilization. Write about the role of various instruments used to create sterile condition for cell and tissue culture. Add a note on Media preparation?
(or)
- 4) Write in detailed about Enzyme assay, activity, turnover yield. Add a note on Enzyme kinetics?

UNIT-III

- 5) Write in detail about radioactive decay. Measurement of radioactivity, safety measurements and disposal of radioactive wastes?
(or)
- 6) Define Chromatography? Write about Principle, types, and applications of Chromatography?

UNIT-IV

- 7) Write about graphical representation of data. Add a note correlation and regression?
(or)
- 8) Describe about tabulation and graphical representation of data. Add a note on ANOVA?

UNIT-V

- 9) Write about the various applications of Bioinformatics in Biology?
(or)
- 10) Write, in detail about IPR & IPP?

P. Vijaya Vimala
Head, Dept. of Zoology
Adikavi Nannaya University
Rajahmendravaram

Amritha
Convener, Board of Studies
Zoology (P.G.)
Adikavi Nannaya University
Rajahmendravaram

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
School of Life and Health Sciences
Pre-PhD Examinations 2020

Paper – II: Biogeochemistry & Research Methodology

Max Marks: 100M

Duration: 3hour

ALL Questions carry equal marks
Answer any FIVE of the following eight questions

UNIT-I

- 1. Write about conservative and non-conservative elements and Residence time its computation?
(or)
- 2. Write in detail about collection of sampling and analysis of Dissolved Inorganic and Organic Nutrients?

UNIT-II

- 3. Write about role of micro and macro nutrients in marine system and their role on Productivity?
(or)
- 4. Describe the T-S diagrams, Nitrogen imbalances and denitrification?

UNIT-III


- 5. Write in detail about DON Concentration, sources, sinks in aquatic environments?
(or)
- 6. Describe about DON importance in ocean ecosystem?

UNIT-IV

- 7. What is the role of DOM in system and Origin, Elemental and chemical composition, distribution and fate?
(or)
- 8. Write about Stokes law of falling particles and its application in the sea and write about degradation of organic matter under aerobic and anaerobic conditions?

UNIT-V

- 9. Write about TOC/TN Analyzer, principle, instrumentation, their application in determination of Dissolved Organic Nitrogen in sea water
(or)
- 10. Describe about IRMS principle, instrumentation and its applications to measure C13, N15 isotopic composition?


Dr. A. Matta Reddy
Research Supervisor
and BOS Chairman