

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
SCHOOL OF LIFE AND HEALTH SCIENCES
Pre Ph.D Examination Syllabus-2019
(W.E.F 13-12-2019)

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 Biostatistics.

UNIT-V:

Computational Biology-Microsoft office-word, excel and power point presentation, Graphical representation of data using BI, CHL 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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A. Jayaraman

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Confidential

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Paper – II: Cancer Biology & Research Methodology

UNIT-I

Structure, Functions and Properties of Eukaryotic Cells.
Cell Cycle and Regulation
Apoptosis: Genetic regulation of Apoptosis
Oncogenesis: Cellular Oncogenesis

UNIT-II

Types of Cancers and causative factors
Symptoms, Prognosis and diagnosis of Cancer
Methods of treatment for Cancer chemotherapy, radiotherapy, gene therapy.

UNIT-III

Tumor expressive and suppressor genes
Expression of oncogenes - Gene isolation- Primer designing, PCR amplification, Cloning and sequencing, DNA mapping techniques by molecular markers.

UNIT-IV

Stem Cells and Cancer: Role of stem cells in tumor expression and suppression.
Immune cells and Cancer: Role of immune cells in tumor expression and suppression.
Monoclonal antibody therapy for cancer.
Hox genes Classification, function and significant role in development of animals
Regulatory mechanisms of Hox genes in the development of carcinogenesis.

UNIT -V

Emerging technologies for cancer approach--- Targeted delivery & Synthetic lethal approaches.
Microarray chips, Nano technology, Insilico approach and CpG methylation by epigenetics.
Computational analysis of genes.

Texts and References:

1. Jean S. Deutsch Hox Genes Studies from the 20th to the 21st Century
2. Spyros Papageorgiou HOX Gene Expression
3. Weinberg, R. The Biology of Cancer, Garland Science, second edition 2014
4. Hesketh, R. Betrayed by Nature: The War on Cancer, MacSci, 2012
5. McKinnell, Robert G & Parchment, Ralph E. The Biological Basis of Cancer, CUP 2nd edition, 2006

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Candidate wise

Paper - III: Presentation on the Research topic: "Role of Hox genes in Cancer patients".

Course structure:

S.No	Paper title	Test Mode	Marks	Credits
1	Paper I: Recent Advances in Life Science & Research Methodology	Written	100	4
2	Paper II: Cancer Biology & Research Methodology	Written	100	4
3	Paper III: Role of Hox genes in Cancer patients	Presentation	50	2

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

Model papers:

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
School of Life and Health Sciences
Pre-PhD Examinations w.e.f. 2019

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

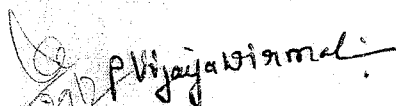
- 5) Write in detail about radioactive decay. Measurement of radioactivity, safety measurements and disposal of radioactive wastes?
(or)
- 6) Define Chromatography? Write about Principle, types, and applications of Chromatography?


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?


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ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
School of Life and Health Sciences
Pre-PhD Examinations w.e.f. 2019

Paper – II: Cancer Biology & Research Methodology

Duration: 3 hour

Max Marks: 100M

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

5X20=100M

UNIT-I

1. Write about the structure, function and properties of eukaryotic cell. Add a note on cell cycle and regulation?
(or)
2. Write in detail about oncogenesis. Add a note on genetic regulation of Apoptosis?

UNIT-II

3. Give a detailed account on Prognosis and Diagnosis of Cancer?
(or)
4. Describe the various molecular methods used for the treatment of Cancer?

UNIT-III


5. Write in detail about molecular markers for identification of tumor expressive genes?
(or)
6. Write about the tumor suppressor genes with their mechanisms underlying carcinogenesis?

UNIT-IV

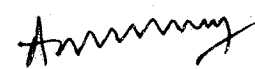
7. What is the role of immune cells in tumor expression and suppression? Add a note on therapy for cancer.
(or)
8. Write in detail about Hox genes classification and significance.

UNIT-V

9. Write about emerging technologies for cancer approach?
(or)
10. Describe epigenetic mechanisms associated with carcinogenesis?


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