Dr. APJ Abdul Kalam University Indore

Scheme of Examination
B.Sc.
Semester-VI
(w.e.f. July 2016 Onwards)

(Non Grading)

Course Name	Subject	Theory Max. Marks				Practical Max Marks		Total
		Internal		External		Max Marks	Min Marks	
		Max	Min	Max	Min			
Foundation Courses	HINDI+ ENGLISH **FCS 601 HE**	10+05= 15	05	50+35=85	28	-	-	100
	Basics of Computer & Information Technology – II **FCS 602 EP**	15	05	35	12	-	-	50
B. Sc. Life Science	BOTANY **BSB 601 T**	15	05	85	28			100
	BOTANY **BSB 601 P**	-	-	-	-	50	17	50
	CHEMISTRY **BSC 602 T**	15	05	85	28	50	17	100
	CHEMISTRY **BSC 602 P**	-	-	-	-	50	17	50
	ZOOLOGY **BSZ 603 T**	15	05	85	28	50	17	100
	ZOOLOGY **BSZ 603 P**	-	-	-	-	50	17	50
Total								**600**

Dr. APJ Abdul Kalam University Indore

B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: - B.Sc.

Semester: - VIth Semester

Subject: - Botany (BSB601T)

Paper: - Cell Biology, Genetics and Biotechnology

Marks 85+15 CCE

Unit-1 The cell envelops and cell organelles: plasma membrane, lipid bilayer structure, functions of the cell wall. Structure and function of cell organelles Nucleus Chloroplast, Mitochondrion. Golgibodies, ER, Peroxisome and Vacuole.

Unit-2 Chromosomal organization: Structure and functions of Chromosome, centromere and telomere special types of chromosomes, Mitosis and Meiosis. Variations in chromosome structure : Deletion, Duplication ,Translocation and Inversion; Variation in chromosome number, Euploidy, Aneuploidy, DNA the genetic material, DNA structure and replication. Nucleosome model.

Unit-3 Genetic inheritance: Mendelism: laws of dominance, segregation and independent assortment; Linkage analysis; Interactions of genes. Cytoplasmic inheritance Mutations: spontaneous and induced: Transposable elements; DNA damage and repair.

Unit-4 Gene: Structure of gene, genetic code, transfer of genetic information; Transcription, translation, protein syntesis, tRNA, and ribosomes. Regulation of gene expression in prokaryotes and eukaryotes.

Unit-5 Biotechnology: Functional definition; basic aspects of plant tissue culture; cellular totipotency, differentiation and morphogenesis biology of Agrobacterium; vectors for gene delivery and marker genes. Important achievements of biotechnology in agriculture.
Genetic engineering: Tools and techniques of recombinant DNA technology; cloning vectors; genomic and cDNA library; transposable elements. Gene mapping and chromosome walking.

Suggested Books :

1.Alberts B.D. Lewis, J.Raff, M.Rubers, K. and Watson I.D. 1999 molecular Biology of Cell Garland Pub. Co. Inc. New York, U.S.A.

2. P.K. Gupta 1999 A text Book of Cell and Molecular Biology, Rastogi Pub. Meerut India.

3.Kleinsmith L.J. and Molecular Biology (2nd edition) Harper Collins College pub. New York USA.

4.P.K. Gupta Genetics Rastogi Pub. Meerut.

5.Sinha & Sinha Cytogenetics & Plant Breeding Vikas Pub.

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Class: - B.Sc.
Semester: - VIth Semester
Subject: - Botany (BSB601P)

Objectives

i) To impart understanding of internal cell structures and their organization.
ii) To develop the skills for the preparation of smear for study of cell division.
iii) To develop the skills for the understanding of mendel's law.
iv) To impart the skills of isolation of DNA.
v) To familiarize the students with the technique of micro propagation and isolation of protoplast.

Semester-VI
Scheme of practical examination

Time: 4 Hrs	**Marks:50**
Exercise Based on cell division (Mitosis/Meiosis)	10
Exercise Based on Genetic problem	5
Study of Cell and Cell inclusions	5
Exercise based on Biotechnology	5
Spotting (1-5)	10
Viva – Voce	5
Sessional	10
Total	**50**

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B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: B.Sc.

Semester: VI Semester

Subject: Chemistry (BSC602T)

Marks 85+15 CCE

Unit-I

A. Amino acids: Classification, structure, stereochemistry of amino acids, acid base behavior, isoelectric point, general methods of preparation and properties of α-amino acids. Proteins and peptides. Introduction to peptides linkage, end group analysis, classification, properties and structure of proteins (primary, secondary and tertiary).

B. Nucleic acids: Introduction of nucleic acids and constituents of nucleic acid Ribonucleosides, Ribonucleotides, double helical structure of DNA.

C. Elementary idea of Fats, Oils & Detergents: Natural fats, edible and industrial oils of vegetable origin, common fatty acids, glycerides, hydrogenation of unsaturated oils, Saponification value, iodine value, acid value.

Unit-II

A. Organometallic Chemistry: Synthesis; structure and b bonding in metal carbonyl complexes, metal olefin complexes and metal alkyne complexes. Oxidative addition reactions.

B. Organometallic Compounds: Organomagnesium Compound - Grignard Reagent and Organolithium Compounds, methods of preparation, structure and synthetic applications.

Unit-III

A. Magnetic properties of transition metal complexes: magnetic moment (spin only and with L-S coupling), orbital contribution magnetic moment.

B. Electronic spectra of transition metal complexes: Spectroscopic ground and excited states, types of electronic transitions, selection rules for d-d transitions, Orgel-energy level diagram for d1 to d9 states.

C. Water Analysis: Hardness, types of hardness, acidity and alkalinity, BOD, COD and DO.

Unit-IV

A. Infrared spectroscopy : Statement of the Born-Oppenheimer approximation, rotational spectrum of diatomic molecules. Energy levels of a rigid rotator, selection rule, intensity of absorption bands, Maxwell- Boltzmann distribution and population of energy levels.

B. Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity and qualitative relation of force constant and bond energies, degree of freedom and modes of vibration, vibrational frequencies of different functional groups.

C. Raman Spectroscopy: concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules. Selection rules, application of Raman spectrum.

Unit-V

A. NMR Spectroscopy Principle and Instrumentation, NMR active nucleus, chemical shift, spin-spin coupling, spectrum of ethanol and ethanal.

B. Surface Phenomena and Catalysis: adsorption of gases and liquids on solid adsorbent, Freundlich and Langmuir adsorption isotherms, determination of surface area, characteristics and mechanism of heterogeneous catalysis.

Books Suggested:-

1. Physical Chemistry, R.A. Alberty, Wiley Eastern Ltd.
2. Physical Chemistry Through problems, S.K. Dogra and S. Dogra, Wiley Eastern
3. Organic Chemistry, Morrison and Boyd, Prentice Hall.
4. Organic Chemistry, L.G. Wade Jr. Prentice Hall
5. Fundamentals of Organic Chemistry Solomons, John Wiley.
6. Organic Chemistry, Vol. I, IL IIL S.M. Mukherji, S.P. Singh and R.P. Kapoor,
7. Organic Chemistry, F.A. Carey, McGraw-Hill Inc.
8. Introduction to Organic Chemistry, Streitwiesser, Heathcock and Kosover, Macmillan.
9. Vogel's Qualitative & quantitative Analysis Vol- 1, 2, 3, ELBS.
10. Advanced Organic chemistry, I. L. Finar, ELBS.
11. Basic Concepts of Analytical chemistry, S M Khopker, New Age International Publishers.
12. Analytical Chemistry, R.M. Verma, CBS Publication.
13. Analytical Chemistry, Skoog & West, Wiley International.
14. Essentials of Physical Chemistry, B.S. Bahl, Arun Bahl & G.D. Tuli, S. Chand & Company Ltd.
15. Atomic structure and Molecular spectroscopy, Manas Chanda, New Age International Publishers.
16. Molecular Spectroscopy, Sukumar, MJP Publishers.
17. Organic Chemistry, Mac Murrey, Pearson Education.
18. Inorganic Chemistry – J.D. Lee, John Wiley
19. Inorganic Chemistry – Cotton and Wilkinson, John Wiley
20. Inorganic Chemistry – Huheey, Harper Collins Pub. USA
21. Inorganic Polymer – G.R. Chhatwal, Himalaya Pub.House

22ण मध्य प्रदेष हिन्दी ग्रन्थ अकादमी भोपाल द्वारा प्रकाषित रसायन विज्ञान की पाठ्यपुस्तक।

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B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: B.Sc.

Semester: - VI Semester

Subject: Chemistry (BSC602P)

M.M. 50 **Time: 6 Hours**

Organic sChemistry: - **12 Marks**

Binary mixture analysis containing two solids : Separation, identifications and preparation of derivatives.

A. Physical Instrumentation **12 Marks**

(i) Job's Method
(ii) Mole-ratio method

B. Inorganic Chemistry **12 Marks**

(i) Effluent Analysis
Identification of cations and anions in different water samples.
(ii) Water analysis
To determine the amount of dissolved oxygen in water semples
(iii) Determination of Hardness of Water.

Viva **06 Mark**

Sessional **08 Marks**

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B.Sc. Under Graduate Semester wise Syllabus

(w.e.f. session 2016onwards)

Class: - B.Sc.

Semester: - VIth Semester

Subject:-Zoology (BSZ 603T)

Paper: - Ecology and Applied Zoology

Marks 85+15

Unit-I **Concept of Ecology:**

1. Abiotic and biotic factors
2. Energy flow in ecosystem : Food chain and Food web
3. Biogeochemical cycle : Co_2 N and P
4. Population Concept – Characteristics of population. Factors affecting Population growth, Pollution indicators.

Unit-II **Habitat Ecology**

1. Fresh water , marine and terrestrial habitat
2. Ecological division of India.
3. Biodiversity : Natural resources and their conservation with special reference to forests.

Unit-III **Man and Environment**

1. Wild life conservation(Laws , National Parks and Sanctuaries of MP)
2. Endangered species of India.
3. Types of pollution: Air, water, soil, thermal and noise pollution.
4. Urbanisation and effect of human population on environment.

Unit-IV **Aquaculture**

1. Prawn culture: Culture of fresh water prawn , methods of prawn fishing , preservation and processing of prawns
2. Pearl culture and pear industry.
3. Frog culture: Breeding and selection.
4. Major carp culture : Management of ponds , preservation and processing of fishes.
5. Maintenance of Aquarium.

Unit-V **Economic Entomology**

1. Sericulture: Species of silkworm, life history of *Bombyx mori*, Sericulture Industry in India.
2. Apiculture – Life cycle of the species methods of bee keeping, products of bees, enemies of bees.
3. Lac culture: Lifecycle, and association with the host plant.

4. Common pests: Stored grains: *Sitophilus oryzae and Tribolium Castanaeum,* Vegetable pest*:* *Piers brassicae and Dacus cucurbitae.*
5. Biological control of insect pests

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B.Sc. Under Graduate Semester wise Syllabus

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Class: - B.Sc.

Semester: - VIth Semester

Subject:-Zoology (BSZ 603P)

Marks 85+15

1. Study of fresh water, marine and terrestrial fauna
2. Water analysis- Dissolved Oxygen, Chloride, pH, hardness, turbidity, temperature
3. Pond ecosystem
4. Wild life: Endangered and threatened species
5. Study of specimen related to micro and mega evolution: Commensalism, symbiosis, mimicry, parasitism, colouration, etc.
6. Study of various fossils: Limulus, Latimera, Dinosaurs, Archaeopterux
7. Models of ecosystem
8. Study of life cycles of animals of economic importance
9. Study of planktons
10. Study of pests

Distribution of Marks

Time 3 hours **Maximum Marks: 50**

	Marks Allotted
1. Physicochemical analysis of water bodies	10
2. Excercise based on applied zoology (life cycles)	05
3. Excercise based on museum keeping techniques	05
4. Spotting	16
5. Models of ecosystem	04
6. Viva	05
7. Recrd	05
Total	50

Suggested Books for B.Sc. Zoology

Books of Granth Academy

Parker & Haswell: Text Book of Zoology Vol-I & II

Jordan, E.L. and Verma, P.S.: Chordata Zoology

Nigam, H.C.: Zoology of Chordates

Rastogi, V.B.: Developmental Biology

Arora, M.P.: Embryology

Karp: Cell and Molecular Biology

Sheelar & Bianchi: Cell and Molecular Biology

Lewin: Genetics (Latest editionStrickberger: Genetics

Berry, A.K. Animal Physiology and Biochemistry

Prosser: Comparative Animal Physiology

Lehninger: Biochemistry

Bisen, P.S. Laboratory Protocols in Applied Life Sciences

Bisen, P.S.: Introduction to Instrumentation in Life Sciences

Odum, E.P.: Fundamental Ecology

Agrawal, K.C.: Biodiversity

Colbert: Evolution

Natrajan, S.S.: A Manual; of Fresh Water Aquaculture

Sharma, P.D.: Environmental Biology & Toxicology

Swaroop & Pathak: Laboratory Techniques in Modern Biology