Dr. APJ Abdul Kalam University Indore



# Dr. A.P.J. Abdul Kalam University, Indore (M.P)

Scheme of Examination B.Sc. Semester-I (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 101 HE	10+05=15	05	50+35=85	28	-	-	100
	E-SHIP FCS 102 EP	15	05	35	12	-	-	50
B. Sc. Life Science	BOTANY BSB 101 T	15	05	85	28			100
	BOTANY BSB 101 P	-	-	-	-	50	17	50
	CHEMISTRY BSC 102 T	15	05	85	28	50	17	100
	CHEMISTRY BSC 102 P	-	-	-	-	50	17	50
	ZOOLOGY BSZ 103 T	15	05	85	28	50	17	100
	ZOOLOGY BSZ 103 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: - I Semester

### Subject: - Botany (BSB101T)

### Paper: - DIVERSITY OF MICROBES AND CRYPTOGAMS

### Marks 85+15 CCE

### Particulars

- **Unit-1 Prokaryots:** characteristics of Viruses, general account of TMV and T4 bacteriophage. Bacterial structure, nutrition, reproduction and economic importance; General account of Mycoplasma Cynobacteria and Actinomycetes.
- **Unit-2 Algae** : General characters, classification and economic importance. Important features and life history of Chlorophyceae- *Volvox, Oedogonium,* Charophyceae- *Chara* Xanthophyceae - *Vaucheria,* Phaeophyceae - *Ectocarpus,* Rhodophyceae - *Polysiphonia.*
- **Unit-3 Fungi:** General characters, classification and economic importance, Important features and life history of Mastigomycotina- *Phytophthora*, Zygomycotiana *Mucor*, Ascomycotina : *Aspergillus*, *Peziza*, Basibiomycotina *Puccinia*, Deurteromycotina *Cercospora*. General account of Lichens.
- **Unit-4 Bryophyta :** Classification, study of morphology, anatomy, reproduction of Hepaticopsida : *Riccia, Marchantia* ; Anthocerotopsida: *Anthoceros,* Bryopsida: *Polytrichum*
- **Unit-5 Pteridophyta** : Important characters and classification. Stelar organization. Morphology and anatomy of Rhynia. Structure, anatomy and reproduction in Lycopodium, Selaginella, Equisetum and Marsilea.

### **Suggested Books :**

- i) G.M. Smith 1971 Cryptogamic Botany. Vol I Algae & Fungi Tata McGrraw Hill Pub. Co. NewDelhi.
- ii) G.M. Smith 1971 Cryptogamic Botany. Vol -II Bryophytes & Pteridophytes. Tata McGrraw Hill Pub. Co. New Delhi.
- iii) O.P.Sharma,1992. Text book of Thallophyta McGrraw Hill Pub. Co.
- iv) O.P.Sharma, 1990. Text book of Pteridophyta McMillan india Ltd.
- v) P.D.Sharma 1991. The Fungi. rastogi & Co. Meerut.
- vi) H.C. Dubey.1990. an introduction of Fungi.Vikas Pub. house pvt.ltd.
- vii) P.Puri 1980. Bryophyta Atma ram & Sons, Delhi.
- viii) A.Clifton.1958. Introduction to the Bacteria. Mcgrew Hillpub. Co.New delhi.



Class: - B.Sc. Semester: - I Semester

Subject: - Botany (BSB101P)

### Practical

### **Objectives:**

- i) To develop the skills of staining and observation of lower organism.
- ii) To impart the skills of temporary and permanent slide preparations.
- iii) To enhance ability to identify the lower organisms using microscope.
- iv) To familiarize the students with diseases and their causative agents.

### Scheme of practical examination

### Time: 4 hrs

Marks: 50

Total:	50
	05
	05
	10
	05
	10
	10
	05
	Total :



B.Sc. Under Graduate Semester wise Syllabus (W.e.f. session 2016 onwards)

## Class: - B.Sc. Semester: - I Semester Subject: - Chemistry (BSC102T)

Marks 85+15 CCE

### Unit-1

**A. Mathematical Concepts:** Logarithmic relations, (rules and types), use of log table and antilog table in calculations, curves sketching, straight line and linear graphs, calculation of slopes, Differentiation of functions like Kx, ex, xn, sinx, logx; multiplication and division in differentiation, maxima and minima, partial differentiation and reciprocity relations. Integration of some useful/relevant functions; Factorials, Probability.

**B.** Gaseous States and Molecular Velocities: Critical phenomenon : PV isotherms of ideal gases, Andrew's experiment, continuity of states, the isotherms of van der Waals equations, relationship between critical constants and Vander Waals constants, Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision numbers, mean free path and collision diameter.

### Unit-2

**A. Liquid State:** Intermolecular forces, structure of Liquids (a qualitative description) Liquid crystals: Difference between liquid crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.

**B. Solid State:** Definition of space lattice, Unit cell, Laws of crystallography - (i) Law of constancy of interfacial angles (ii) Law of rationality of indices (iii) Laws of symmetry, Symmetry elements in crystals. Ionic solid structures, radius ratio, radius ratio effect and coordination number, limitations of radius rule, lattice defects.

### Unit-3

**A. Elementary Quantum Mechanics:** Schrodinger wave equation, significance of \_ and \_2, radial and angular wave functions and probability distribution curves, effective nuclear charge.

**B. Periodic Properties :** Definition, application and periodicity of Atomic and ionic radii, ionization energy, electron affinity and electronegativity

**C. Chemical Bonding:** Covalent bonding as applied to valence bond theory and its limitations, directional characteristic of covalent bond. Hybridization and shapes of simple molecules and ions, Valence Shell Electron Pair Repulsion (VSEPR) theory to NH3, SF4, CIF3, ICI2, H2O.

## Unit-4

**A. s-Block Elements:** Comparative study, diagonal relationship, salient features of hydrides, solvation and complexation tendencies including their, function in bio systems an introduction to alkyls and aryl complexes.



**B. p-Block Elements :** Comparative study (including diagonal relationship) of groups 13-17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13-16. Hydrides of boron-diborane and higher boranes. Borazine, borohydrides.

### Unit-5

**A. Bond Parameters Bond lengths and bond angles, bond energy:** Localized and delocalized chemical bond, Vander Waal interactions, with reference to supra molecular chemistry, resonance, hyperconjugation, inductive and field effects, hydrogen bonding.

**B. Types of Reagents:** Electrophiles and nucleophiles. Types of organic reactions. Energy consideration. Hemolytic and heterolytic cleavage Reactive intermediatescarbocations, carbanions, free radicals and carbenes\benzynes.

**C. Stereochemistry:** Concept of Stereoisomerism, types of Stereoisomerism, elements of symmetry Chiral and achiral compounds. Fischer projection formulae; optical isomerism of lactic and tartaric acids, enantiomerism and diastereoisomerism; configuration (relative and absolute); conformations of ethane and n-butane and cyclohexane.

D, L-and R, S-notations of compounds containing chiral centers; projection formulae – Fischer, Newman and Sawhorse of compounds containing two adjacent chiral centers; meso and dl-isomers, erythro and threo isomers; racemization and resolution; geometrical isomers; E and Z notations.

### Suggested book

1. Physical Chemistry-Puri, Sharma and Pathania, Vikas Publications, New Delhi

2. Physical Chemistry -G.M. Barrow, International Student Edition, McGraw Hill.

3. The Elements of Physical Chemistry, P.W. Atkins, Oxford Un iv e r s i t y Press

- 4. Physical Chemistry, R.A. Alberty, Wiley Eastern Ltd.
- 5. Physical Chemistry Through problems, S.K. Dogra and S. Dogra, Wiley Eastern
- 6. Organic Chemistry, Morrison and Boyd, Prentice Hall.

7. Organic Chemistry, L.G. Wade Jr. Prentice Hall

- 8. Fundamentals of Organic Chemistry Solomons, John Wiley.
- 9. Organic Chemistry, Vol. I, IL IIL S.M. Mukherji, S.P. Singh and R.P. Kapoor,
- 10. Organic Chemistry, F.A. Carey, McGraw-Hill Inc.
- 11. Introduction to Organic Chemistry, Streitwiesser, Heathcock and Kosover, Macmillan.
- 12. Vogel's Qualitative & quantitative Analysis Vol- 1, 2, 3, ELBS.
- 13. Advanced Organic chemistry, I. L. Finar, ELBS.

14. Basic Concepts of Analytical chemistry, S M Khopker, New Age International Publishers.

15. Analytical Chemistry, R.M. Verma, CBS Publication.

16. Analytical Chemistry, Skoog & West, Wiley International.

17. Essentials of Physical Chemistry, B.S. Bahl, Arun Bahl & G.D. Tuli, S. Chand & Company Ltd.

18. Atomic structure and Molecular spectroscopy, Manas Chanda, New Age International Publishers.

19. Molecular Spectroscopy, Sukumar, MJP Publishers.

20. Organic Chemistry, Mac Murrey, Pearson Education.

21. Inorganic Chemistry – J.D. Lee, John Wiley

22. Inorganic Chemistry – Cotton and Wilkinson, John Wiley

- 23. Inorganic Chemistry Huheey, Harper Collins Pub. USA
- 24. Inorganic Polymer G.R. Chhatwal, Himalaya Pub.House
- 25 मध्य प्रदेश हिन्दी ग्रन्थ अकादमी भोपाल द्वारा प्रकाशित रसायन विज्ञान की पाठ्यपुस्तक।

26 मध्य प्रदेश हिन्दी ग्रन्थ अकादमी भोपाल द्वारा प्रकाशित प्रायोगिक रसायन की पाठ्यपुस्तक 👿 Dr. APJ Abdul Kalam University Indore

B.Sc. Class: -Semester: - I Semester Subject: -Chemistry (BSC102P)

Max Marks: 50

### Duration of practical during the semester examination: 4 hours

### **Physical Chemistry**

### (A).Any one experiment

- 1. Calibration of thermometer
- 2. Determination of melting point
- 3. Determination of boiling point
- 4. Preparation of solutions of various concentration, NaOH, HCl, H2SO<sub>4</sub>.

### (B). Any one experiment

- Determination of surface tension/percentage composition of given 1. organic mixture using surface tension method
- 2. Determination of viscosity / percentage composition of given organic mixture using viscosity method.

### **Organic chemistry**

- 1. Distillation
- 2. Crystallization
- 3. Decolourisation and crystallization using charcoal
- 4. Sublimation
- 5. Detection of elements and functional groups
- 6. Organic molecules through models with special reference to optical and Geometrical isomerism.

Viva: 6 marks Records: 8 marks

### 12 Marks

12 Marks

12 Marks



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B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards) Class: B.Sc. Semester: I Subject: Zoology (BSZ 103T) Title of Paper: Invertebrate

### Unit-I:

- **1.** Elementary Knowledge of Zoological Nomenclature and International Code.
- 2. Classification of Lower Invertebrates (According to Parker and Haswell 7th edition)
- 3. Classification of Higher Invertebrates (According to Parker and Haswell 7th edition)
- 4. Protozoa- Type Study of Plasmodium.
- 5. Protozoa and Diseases.

### Unit-II:

- 1. Porifera- Type study of Sycon.
- 2. Types of Canal system.
- 3. Coelenterata- Type study of Obelia
- 4. Corals and Coral Reef formation.

### Unit-III:

- 1. Helminthes- Type study of Liver Fluke.
- 2. Nematodes and diseases.
- 3. Annelida- Type study of earthworm , metamerism.
- 4. Type Study of Hirudinaria.
- 5. Structure and significance of Trochophore larva.

### Unit-IV:

- 1. Arthropoda- Type study of Prawn.
- 2. Types study of Periplanata.
- 3. Larval forms of Crustacea.
- 4. Insect as Vectors of human diseases.

### Unit-V:

- 1. Mollusca- Type study of Pila
- 2. Echinodermata- External features and water vascular system of Star fish.
- 3. Larval forms of Echinoderms.
- 4. Minor Phyla Ectoprocta & Rotifera.



## Class: B.Sc. Semester: I Subject: Zoology (BSZ 103P) PRACTICAL

The Practical's work will be based on theory syllabus and the candidates will be required

to show knowledge of the following -

- 1. Study of Museum Specimens, slides relevant to the type study in theory
- 2. Mounting (Temporary)
- Mouth parts of insects
- Statocyst of Prawn
- Ctenidium and Osphradium of Pila
- .99Mounting Material (Preserved)
- 3. Major Dissection
- Earthworm: Digestive system, nervous system and reproductive system
- Cockroach : Digestive system, Nervous system
- Prawn : Nervous system, Appendages
- Pila: Nervous system
- 3. Minor Dissection
- Hastate plate and appendages of Prawn
- Salivary glands of Cockroach.
- Radula of Pila.
- Earthworm: Typholosole
- Major & minor dissection based on soft name