Dr. APJ Abdul Kalam University Indore

Scheme of Examination
B.Sc.
Semester-V
(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 501 HE**	10+05=15	05	50+35=85	28	-	-	100
	Basics of Computer & Information Technology - I **FCS 502 EP**	15	05	35	12	-	-	50
B. Sc. Life Science	BOTANY **BSB 501 T**	15	05	85	28			100
	BOTANY **BSB 501 P**	-	-	-	-	50	17	50
	CHEMISTRY **BSC 502 T**	15	05	85	28	50	17	100
	CHEMISTRY **BSC 502 P**	-	-	-	-	50	17	50
	ZOOLOGY **BSZ 503 T**	15	05	85	28	50	17	100
	ZOOLOGY **BSZ 503 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: - Vth Semester

Subject: - Botany (BSB501T)

Paper: - PLANT PHYSIOLOGY AND BIOCHEMISTRY

Marks 85+15 CCE

Unit-1 Plant Water Relations: Properties of water, Importance of water in plant life, Diffusion, Osmosis & Osmotic relation to plant cell. Water Absorption, Ascent of Sap. Transpiration: Structure & Physiology of Stomata, Mechanism of Transpiration, Factors affecting the rate of transpiration.

Unit -2 Plant Nutrition: Mineral nutrition, Hydroponics, Absorption of mineral Nutrients, Translocation of organic solutes. Biomolecules: Structure Classification and functions of Carbohydrates, Amino Acids, Proteins and Lipids.

Unit-3 Photosynthesis: Chloroplast, Photosynthetic pigments, Red drop, Emerson' effect, Concept of two Photosystems, Light reaction, Dark reaction – Calvin cycle, Hatch & Slack cycle, CAM cycle, Factors affecting rate of photosynthesis & Photorespiration.

Unit-4 Respiration: Mitochondria, aerobic and anaerobic respiration, Respiratory coefficient, mechanism of respiration - Glycolysis, Kreb's cycle, Pentose Phosphate Pathway, Electron transport system, Factors affecting rate of respiration, Redox potential and theories of ATP synthesis.

Unit-5 Enzymology: Classification, nomenclature and characteristics of Enzymes, Concept of holoenzyme, apoenzyme, co-enzyme and co-factors. Mode & mechanism of enzyme action, Factors affecting enzyme activity. Plant Hormones: Discovery, Structure mode of action and role of Auxins, Gibberellins, Cytokinin ,Abscissic acid and Ethylene.

SUGGESTED READINGS:-

- David, L. N. and Michael, M. C. 2000. Lehninger's Principle of Biochemistry, Macmillan worth Pub. New York, USA.
- Gangulee, H.C.,Das, K.S., Datta, C. and Sen, S. 2007. College Botany Voll.I, New Central Book Agency (P) Ltd. Kolkata, 700009.
- Hopkins, W.G. 1995. Introduction of Plant Physiology Pub. John wiley and Sons New York.
- Jain, V.K. 1974. Fundamentals of Plant Physiology, S. Chand & Company.
- Pandey, B. P. 2010. A Text book of Botany- Angiosperms, S. Chand & Company Ltd. Ramnagar, New Delhi- 110055.
- Taiz & Zeiger, E. 1998. Plant Physiology. Sinauer associates, Inc. Pub. Massachusetts U.S.A.
- Verma, S.K. & Verma, M.A. 1995. Text book of Plant Physiology & Biotechnology. S. Chand & Company.

Dr. APJ Abdul Kalam University Indore

Class: - B.Sc.
Semester: - Vth Semester
Subject: - Botany (BSB501P)

Objectives:

To impart the skills of handling and setting up of apparatus to conduct plant Physiological experiments, Collection of data and interpretation of results.

Exercise:

1- Preparation of solution of specific Normality, Molal and Molar solutions.
2- Exercises related to osmosis and osmotic relation.
3- Exercises related to Transpiration.
4- To separate Plastidial pigments by Paper Chromatography.
5- To perform the exercise of Photosynthesis & Respiration.
6- To perform biochemical test for Carbohydrate, Lipid and Protein.
7- To extract Enzyme from any plant part and demonstrate its activity.

Scheme of Practical

Time: 4 Hrs **Marks: 50**

1.	Exercise based on plant physiology	15
2.	Miner Exercise based on plant physiology	5
3.	Comment on plant hormone	5
4.	Bio Chemical Test	5
5.	Spotting- (1-5)	10
6.	Viva- voce	5
7.	Sessional	10
		Total : 50

Dr. APJ Abdul Kalam University Indore

B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: B.Sc.

Semester: V Semester

Subject: Chemistry (BSC502T)

Marks 85+15 CCE

Unit-I

Organic Compounds of Nitrogen:

Preparation, properties and chemical reactions of nitroalkanes and nitroarenes. Mechanism ofnucleophilic substitution in nitroarenes and their reduction in acidic neutral and alkaline media, picric acids. Halonitroarenes; structure and nomenclature, and their activity. Amines structure, and nomenclature, physical properties and stereochemistry, separation of mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines. Amine salts as phase transfer catalysts. Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles), reductive amination of aldehydic and ketonic compounds, Gabriel – phthalamide reaction, Hoffmann bromamide reaction, Reaction of amines, electrophilic aromatic substitution in aryl amines, reaction of amines with nitrous acid synthetic transformation of aryl diazonium salts, azo coupling.

Unit-II

Carbohydrates-I

Classification and nomenclature, monosaccharide, mechanism of osazone formation, chain lengthening and chain shortening of aldoses, epimerization, configuration of monosaccharide, erythro, threo diasterioisomers. Formation of glycosides, ethers and esters, determination of ring size of monosaccharide, cyclic structure of D(+) glucose, mechanism of mutarotation. Structure of ribose and deoxyribose.

Carbohydrates-II

An introduction to glycosidic linkages in di and polysaccharides. Reducing and non-reducing sugars.

Unit-III

(a) Photochemistry: Electromagnetic radiation, range of different regions of the spectrum, different expression units for energy, wavelength and frequency Interaction of radiation with matter, difference between thermal and photochemical process. Laws of photochemistry – Grotthus-Draper law, Stark-Einstein law, Beer-Lambert law. Electronic transitions, Jablonski diagram depicting various quantum yield.

(b) UV Spectroscopy: Electronic excitation, elementary idea of instrument used, Application to organic molecules. Woodward-Fieser rule for determining _max of enes, polyenes and _, ı- unsaturated carbonyl compounds.

Unit-IV

Bioinorganic Chemistry - I

Essential and trace elements in biological processes, metalloporphyrins with special reference to haemoglobin and myoglobin, Biological role of alkali and alkaline earth metal ions with special reference to Ca^{2+}.

Bioinorganic Chemistry - II
Role of metal ions in biological process, nitrogen fixation, oxygen-uptake proteins, cytochromes and ferredoxins.

Unit-V
Hard and Soft Acids and Bases (HSAB) Classification of acids and bases as hard and soft, Pearson's HSAB concept, symbiosis.
Analytical Chemistry: Errors, their classification, minimization of errors, precision and accuracy, gravimetric estimation - concept, method and precautions, gravimetric estimation of barium and copper.
Inorganic Polymers: Introduction and scope of inorganic polymers, special characteristics, classification and their applications. Structure and nature of bonding in Silicones and triphosphonitrilic chloride.

Books suggested:-

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 Uni v er 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 प्रदेष हिन्दी ग्रन्थ अकादमी भोपाल द्वारा प्रकाषित रसायन विज्ञान की पाठ्यपुस्तक।
26 मध्य प्रदेष हिन्दी ग्रन्थ अकादमी भोपाल द्वारा प्रकाषित प्रायोगिक रसायन की पाठ्यपुस्तक।

Dr. APJ Abdul Kalam University Indore

B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: B.Sc.

Semester: - V Semester

Subject: Chemistry (BSC502P)

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

Inorganic Chemistry **12 Marks**

Analysis of inorganic mixture containing five redicals with at least one interfering radical of typical combination.

Gravimetric analysis : **12 Marks**

Barium as barium sulphate

Organic Chemistry **12 Marks**

Preparation :

- **(i) Acetylation**
- **(ii) Benzoylation**
- **(iii) Meta-Dinitrobenezene**
- **(iv) Picric acid**

Viva **06 Marks**

Sessional **08 Marks**

Dr. APJ Abdul Kalam University Indore

B.Sc. Under Graduate Semester wise Syllabus

(W.e.f. session 2016 onwards)

Class: - B.Sc.

Semester: - Vth Semester

Subject:-Zoology (BSZ 503T)

Paper: - Animal Physiology and Biochemistry

Marks 85+15CCE

Unit I: Nutrition, Metabolism

- Physiology of digestion in mammals
- Protein Metabolism: Deamination, Decarboxylation. Transamination of amino acids, and Ornithine cycle.
- Carbohydrate metabolism- Glycogenesis, Glycogenolysis, glycolysis, The Citric acid cycle, Gluconeogenesis.
- Lipid Metabolism-Beta oxidation of fatty acids.

Unit II: Respiration Excretion and Immune System

- Mechanism and of respiration in mammals(transport of gases, chloride shift)..
- Physiology of Excretion- urea and urine formation in mammals
- Innate and acquired immunity, immune cells and lymphyed system, immune response: cellular and humoral

Unit III: Regulatory Mechanisms and Enzymes

- Thermoregulation.
- Definition and nomenclature of enzymes, classification of enzymes.
- Mechanism of enzyme action.
- Vitamins and Co-enzymes

Unit IV: Neuromuscular Co- ordination

- Introduction to functional anatomy of human brain
- Types of neurons and glial cells
- Theory of muscle contraction and its biochemistry.
- Physiology of nerve impulse conduction.

Unit V: Endocrine system and Reproductive system

- Structure and functions of Pituitary Gland.
- Structure and functions of Thyroid Gland.
- Structure and functions of Adrenal Gland.
- Structure and functions of Parathyroid, Thymus and Islets of langerhan's.
- Physiology of Male reproductive organ and female reproductive organ.

Dr. APJ Abdul Kalam University Indore

Class: - B.Sc.
Semester: - Vth Semester
Subject:-Zoology (BSZ 503P)

Marks 85+15

1. Detection of protein, carbohydrate and lipid.
2. Study of Human salivary enzyme activity in relation to pH.
3. Detection of nitrogenous waste products – Ammonia & Urea
4. Blood pressure measurements
5. Exercise on Haematology – Counting of RBC /WBC and Blood grouping in blood samples.
6. Estimation of Haemoglobin and sugar in blood samples.
7. Histological study of various endocrine glands –T. S. of Thyroid, T. S. of Pituitary gland , T. S. of Adrenal gland , T. S. of Testis, T. S. of Ovary.
8. Histological study of Alimentary canal & various digestive organs – T.S of Stomach , T.S of Intestine ,T.S of Pancreas, and T. S. of liver.
9. Histological study of Visceral organs - T.S of Lungs, L.S. of Kidney
10. Histological study of Muscles – Striated, Unstriated & Cardiac muscle.

Distribution of Marks

Time 3 hours **Maximum Marks: 50**

	Marks Allotted
1. Spotting (10 Spots).	20Marks
2. Biochemical tests	05 Marks
3. Physiological Experiment (RBC/WBC Count/ Blood Group / Hb)	10 Marks
4. Exercise on enzyme activity	05 Marks
4. Viva-Voce.	05 Marks
5. Practical Record and Collection.	05Marks
Total	**50Marks**