बरकतउल्ला विश्वविद्यालय,भोपाल

Barkatullah University, Bhopal

Four-Year Integrated (Eight Semester)
B.Sc.B.Ed. Course

Course of Studies & Prescribed Books
Approved by Board of Studies in Education

Faculty of Education
B.Sc.B.Ed. Integrated Course
Examination 2016-17
I to VIII SEMESTER

प्रकाशक

कुलसचिव

बरकतउल्ला विश्वविद्यालय,भोपाल

2016–17 **मूल्य : 50.00**

Bachelor of Science and Bachelor of Education (R.I.E.)

Barkatullah University

COURSES OF STUDIES

For

Four Year Integrated

B.Sc.B.Ed. (Eight Semesters) Course

SECOND SEMESTER

Second Semester

Subject/ Paper	Paper	Inter.	Total	Pds. /week
B.Sc. Part				
Foundation Course				
Basics of Computer	40	10	50	3
Language – Hindi	40	10	50	3
- English	40	10	50	3
Elective I + Practical	60+25	15	100	9
Elective II+ Practical	60+25	15	100	9
Elective III+ Practical	60+25	15	100	9
Total	**375**	**75**	**450**	
B.Ed. Part				
Cognition & Learning	40	10	50	3
Psychology Practical		25	25	2
Health, Physical Education & Yoga	--	25	25	2
Work Education	--	25	25	2
Art & Aesthetics		25	25	2
Total	**40**	**110**	**150**	
Grand Total	**340**	**260**	**600**	

- Elective 1 – Physics/ Botany.
- Elective 2 – Chemistry.
- Elective 3 – Zoology/Mathematics

(All electives will have one theory paper and external practical examination except Mathematics where there will be two theory papers and practicum which will be valued internally)

Semester Name	Paper	Marks	Paper Code	Name of Papers
II	Paper Theory- III	30	M - 2.1	Differential Equations And Vector Calculus
	Paper Theory- IV	30	M - 2.2	3-D Geometry
	Internal Test	15		Related To Above Papers
	Practicum	25		Related To Above Papers

Work Education: Electricity and Electronics/ Agriculture

B.Sc. Component:

Foundation Course: Basics of Computers

Contact Periods/week: 03

Maximum Marks – 40
Min. Pass Marks – 13
Internal – 10

Objectives: On completion of this course, the student teachers will be able to:

- Appreciate the historical development of computer,
- Demonstrate understanding of the main components of the computer hardware in use,
- Use various digital technologies (hardware and software) for creating resources and providing learning experiences for all types of learners (including differently abled),
- Differentiate between digital and non-digital resources,
- Explain various operating systems and their main functions,
- Use a word processor, spread sheet, drawing and presentation software skillfully and intelligently to produce various teaching learning resources for educational use,
- Use internet technologies efficiently to access remote information, communicate and collaborate with others in different learning situations,
- Understand the social, economic, security and ethical issues associated with the use of Computer and internet.

UNIT-I: Introduction to Computer

- History of computer
- What is a computer: Computer hardware fundamentals (anatomy, input devices, output devices, storage devices, display devices),
- Types of computers: Super Computer, Server Computer, Workstation Computer, Personal Computer or PC, Microcontroller
- Numeral System
    - Introduction
    - Decimal Numeral System
    - Binary Numeral System: Converting Binary to Decimal and vice versa
    - Hexadecimal Numeral System: Converting Hexadecimal to Decimal and vice versa
- Data sizes: bit, nibble, byte, word, KB, MB, GB, TB, PB
- Measurements of Data Speed: bps, kbps, mbps, gbps

UNIT-II: Hardware and Software

- Hardware Fundamentals
    - Use of digital still and video camera, digital sound recorder, scanner, printer, interactive white board, visualizer, and multimedia projector for creating and using multimedia resources
- Software Fundamentals
    - Software –Meaning and types; System software and Application software
    - Operating systems– Meaning and types; Windows, Linux, Macintosh
    - Navigating the desktop, control panel, file manager, explorer, and accessories
    - Concept, philosophy, types, and advantages of Proprietary software, open source software, shareware and freeware
    - Licenses – Software license, document license, fair use and piracy

UNIT-III: **Software Applications**

- Application software- Meaning and types
- Introduction to office applications
    - Word processing – Text (Indian and English), common features, functions and use, Educational applications of word processing
    - Spreadsheet – Common features, functions and use; Educational applications of spreadsheets-Recording, reporting, and research
    - Presentations – Common features, functions and use; Educational applications of presentations

- Databases – Common features, functions and use; Educational applications of database
- Drawing tools – Diagrams, concept maps, timelines, flow charts; Educational applications of these tools

- File formats and conversion, utility tools
- Cloud computing: Meaning and advantages
- Online software tools and applications and their educational use

UNIT-IV: Motherboard and Computer Networks

- Introduction to the motherboard
- Expansion slots: Graphics card, Sound card, Network Interface Cards (NICs), PC Card, Express Card
- Ports: USB, Firewire, Parallel, Thunderbolt, Ethernet
- Definition of network
- Why were networks created?
- Types of common networks: LAN, WAN, The Internet, VPN
- Internet: concept and architecture; Locating internet resources – browsing, navigating, searching, selecting, evaluating, saving and bookmarking
- Computer security: Privacy, hacking, virus, spy ware, misuse, abuse, antivirus, firewall, and safe practices

Sessional Work

- Hands on experience in setting up a desktop PC and working with various input devices, output devices, storage devices, and display devices
- Practicing word processing using Indian language software
- Practice in installing various system and application software
- Using word processor, spread sheet, and presentation software to produce various teaching learning resources and sharing it online
- Locating internet resources – navigating, searching, selecting, saving and evaluating (use standard internet evaluation criteria)

Suggested readings

- Crumlish, C. (1999). The Internet No Experience Required. BPB Publications: New Delhi
- Christopher, M.(2009).Beyond Hardware-Using Existing Technology to promote Higher-Level thinking. Viva Books: New Delhi.
- Evant, M: The International Encyclopedia of Educational Technology.
- James, K.L. (2003). The Internet: A User's Guide. Prentice Hall of India Pvt.Ltd: New Delhi
- Lee, William W., Dianna, L. Owens, (2001) Multimedia based Instructional design: Computer Based Training. Jossey-Bass
- NCERT (2013) Information and Communication Technology for School System: Curricula for ICTs in Education (students and Teachers), Version-1.2, CIET-NCERT, NCERT, New Delhi (www.ictcurriculum.gov.in)
- Noam Shemtov, Ian Walden.(2014)Free and Open Source Software: Policy, Law and Practice. Oxford University Press
- Sarkar, S.K. & Gupta, A.K.(1998). Elements of Computer Science. S.Chand& Company: New Delhi
- Tahenbaum Andrews (2003). Modern Operating Systems. Prentice Hall of India Pvt.Ltd: New Delhi
- Introduction to Computer: https://en.wikiversity.org/wiki/Introduction_to_Computers

Foundation Course: Language – Hindi
आधार पाठय म : हिन्दी भाषा

प्रश्नपत्र – 2

Contact Periods/week: 03

कुल अंक – 40
आन्तरिक मूल्यांकन – 10
प्रश्न एवं अंक निर्धारण

4 समीक्षात्मक / दीर्घउत्तरीय प्रश्न – 28 अंक (7 X 4 प्र.)
लघुउत्तरीय प्रश्न – 07 अंक (35 X 2 प्र.)
वस्तुनि ठ प्रश्न – 05 अंक (1 X 5 प्रश्न)
व्याख्यात्मक एवं समीक्षात्मक प्रश्नों में आंतरिक विकल्प होंगे।

इकाई –1
1. भारत वंदना (कविता) – सूर्यकांत त्रिपाठी निराला
2. पु ष की अभिला ाा (कविता) –' माखनलाल चुर्तवेदी
3. अकाल और उसके बाद (कविता) – नागार्जुन
4. निर्माल्य (ललित निबंध) – विद्यानिवास मिश्र

इकाई – 2
1. अफसर (व्यंग्य) – ारद जोशी
2. भोलाराम का जीव (व्यंग्य) – हरिशंकर परसाई
3. भारत का सामासिक व्यक्तित्व (चिंतन परक) – जवाहरलाल नेहरू
4. भारत देश और उसके निवासी (विश्ले ाण परक) – रामधारी सिंह दिनकर

इकाई –3
1. आदीवासी धरोहर (निबंध) – डॉ. यामाचरण दुबे
2. नारीत्व का अभिशाप (निबंध) – महादेवी वर्मा
3. ब्रह्माण्ड की रचना (वैज्ञानिक लेख) – जयंत वि ाु नार्लीकर
4. प्रमुख वैज्ञानिक आवि कार (संकलित)

Foundation Course: Language English

Paper II

Contact Periods/week: 03

Maximum Marks – 40
Min. Pass Marks – 13
Internal – 10

Distribution of Marks:

1. Four critical questions are to set be from unit I. Two questions are to be attempted. Each question will carry 5 marks. (5 X 2 = 10 marks).
2. Students are required to write a paragraph on a given topic in about 100-125 words. (4 X 1 = 4 marks).
3. Students are required to attempt five questions based on the given unseen passage. Each question will carry 2 marks. (2 X 5 = 10 marks)
4. Students are required to attempt 6 questions on vocabulary. Each question will carry one mark. (1 X 6 = 6 marks)
5. Students are required to attempt 10 questions on Grammar. Each question will carry one mark. (1 X 10 = 10 marks).

UNIT I : William Wordsworth –The Solitary Reaper; Tagore (Trans) – A Song of Kabir; Khushwant Singh – The Portrait of a Lady; Mahatma Gandhi – Satyagraha; R.K. Narayan – The Axe; C.V. Raman – Water

UNIT II: Letter Writing – Formal, Informal and Business Letter

UNIT III: Expansion of an Idea

UNIT IV: Word formation; Prefixes & Suffixes; Figures of Speech.

UNIT V: Grammar & Usage – Tenses, Modals, Gerunds, Infinitives, determiners, Active and Passive Voice, Direct & Indirect Speech

Elective I – Physics

Paper II: Electromagnetic Theory and Elementary Kinetic Theory

Contact Periods/week: 05 + 4 Practical

Maximum Marks – 60
Min. Pass Marks – 20
Internal – 15 (Theory 10 & Practical 5)
Practical – 25 (External)

Note- At least one question will be set from each unit. 20% of the maximum marks will form simple numerical problems and another 20% would be for objective questions with a provision to provide reasoning. All Questions will have 100% internal Choice

Objectives

After completion of this course, the students will be able to

1. Acquaint themselves with concepts of electric fields, electric flux, electric potential, dielectrics and polarization vector.
2. Understand Coulomb's law, Gauss's law Ampere's law, Faraday's law and Lorentz force.
3. Solve the problems on Coulomb's law, Ampere's law and Gauss's law.
4. Understand Ampere's law and its applications.
5. Interpret that a bar magnet has a surface distribution of solenoidal current.
6. Appreciate the physical significance of E and B vectors and their role in the electromagnetic wave propagation.
7. Explain the concept of Poynting vector.
8. Explain varying currents

Unit-1: Electrostatics

Coulomb's law in vacuum expressed in vector form; multipole expansion of fields, work done on a charge in an electrostatic field expressed as a line integral, conservative nature of the electrostatic field, Laplace and Poisson equation in electrostatics and their applications, electric potential ϕ, $E=-\nabla\varphi$, Torque on a dipole in a uniform electric field and its energy, flux of the electric field, Gauss's law and application for finding E for symmetric charge distributions, Gaussian pillbox, field at the surface of a conductor, screening of E field by conductor, energy of a system of charges.

Unit -2: Magnetostatics

Force on a moving charge, Lorentz force equation and definition of B, Force on a straight conductor carrying current in a uniform magnetic field, torque on a current loop, magnetic dipole moment, angular momentum and gyromagnetic ratio.

Biot Savart's law, Ampere's law and its applications, Field due to a magnetic dipole, magnetization current, magnetization vector, magnetic permeability (linear cases).

Unit -3: Dielectrics and Capacitors

Dielectrics; parallel plate capacitor with a dielectric, dielectric constant, polarization, solution to boundary value problems, conducting and dielectric spheres in a uniform electric field, displacement vector D, molecular interpretation of Claussius-Mossotti equation, boundary conditions satisfied by E and D at the interface between two homogeneous dielectrics, illustration through a simple example.

Unit-4: Time varying Fields and Electromagnetic waves

Faraday's law of electromagnetic induction, Self and mutual inductance, Energy in a static magnetic field; Maxwell's displacement current; Maxwell's equations; electromagnetic field energy density.

The wave equation satisfied by E and B; plane electromagnetic waves in vacuum; Poynting vector; reflection at a plane boundary of dielectrics; polarization by reflection; reflection and refraction coefficients at the boundary of two dielectrics (normal incidence only); and total internal reflection; waves in a conducting medium; reflection and refraction by the ionosphere.

Unit-5: Varying Currents

Currents through CR and LR circuits, High resistance by leakage, Alternating and Direct current, Analysis of LC and LCR circuits using complex number representation, Resonance, Q factor, Kirchhoff's law and its application to AC circuits, Transformer and choke coil.

Physics Practical List

1. Conversion of galvanometer into ammeter of given range.
    I. To determine the resistance of a galvanometer by half deflection.
    II. To determine the figure of merit of galvanometer.
    III. To convert the galvanometer into an ammeter of a given range and to calibrate it.

2. To convert the galvanometer into a voltmeter of a given range and to calibrate it.
3. To determine the inductance of a given coil by Anderson bridge method.
4. To study the dependence of capacitance on separation of the plates of capacitor.
5. To study the variation of magnetic field along the axis of a current carrying circular coil.
6. Study of charging and discharging of capacitor.
7. To verify Kirchhoff's current law and voltage law.
8. To determine the high resistance by leakage method.
9. Calibration of voltmeter.
10. Calibration of ammeter.
11. To study ac wave form and to measure rms value of ac voltage using CRO.

Suggested Reading:

1. Electricity Principles and Application, Fowler; Tata McGraw Hills.
2. Electricity and Magnetism, Mahajan; Tata McGraw Hill.
3. Electromagnetic Waves and Radiating systems, Jordan Balman
4. Electricity and Magnetism, K.K. Tewari
5. Electrodynamics, Griffith

Elective I – Botany
Paper II: Cell Biology and Genetics

Contact Periods/week: 05 + 4 Practical

Maximum Marks – 60
Min. Pass Marks – 20
Internal – 15 (Theory 10 & Practical 5)
Practical – 25 (External)

Note: Two questions will be set from each unit and students are required to attempt one question from each unit.

Objectives:

To enable the students to have an understanding about origin of life types, and detailed structure of cell inclusions.

Unit I: Origin of life and organization of cell

General account of origin of life, Structural concept of a cell – prokaryotic and eukaryotic organization, cell types

Unit II: Structure and function of cell organelles

Golgi bodies, cytoskeleton, ER, peroxisome, vacuoles, plastids, mitochondria, ribosome.

Cell envelopes: Plasma membrane – different models; function; cell wall – structure and function.

Unit III: Structure and function of nucleus

General rystallizat of nucleus, ultrastructure of nuclear membrane and nucleolus. Chromosome – rystallizat, morphology, centromere, telomere.

Chromosome alterations – deletions, duplications, translocations, inversions, variation in chromosome number – aneuploidy, polyploidy.

Unit IV : Nucleic acids : DNA

Discovery of DNA as genetic material, its structure and types. DNA replication in prokaryotes and eukaryotes, structure of nucleosome. Satellite and repetitive DNA.

Unit V : Nucleic acid : RNA and cell division

Structure, types (m-RNA, t-RNA, r-RNA) and function of RNA.

Cell division : Cell cycle, mitosis and meiosis

Practical

Objectives:

- To develop skills of staining and slide preparations of lower and higher organism.
- To impart understanding of internal structures and their organization.

- To develop the skills for the preparation of smear for studying of all division.

Cell Biology

1. To study cell structure from onion leaf peels; demonstration of staining and mounting methods.
2. Comparative study of cell structure in onion cells, *Hydrilla* and *Spirogyra.* Study of cyclosis in *Tradescantia* rystal cells.
3. Study of plastids to examine pigment distribution in plants (e.g. *Cassia, Lycopersicon and Capsicum*).
4. Examination of electron micrographs of eukaryotic cells with special reference to organelles.
5. Study of electron micrographs of viruses, bacteria, cyanobacteria and eukaryotic cells for comparative cellular rystallizat.
6. Examination of various stages of mitosis and meiosis using appropriate plant material (e.g. onion root tips, onion flower buds).

Scheme of Practical Examination

1. Preparation of a smear of root tip/anthers to identify different stages of cell division. 5
2. Demonstration of cyclosis in the given material. 5
3. To identify the type of plastids in the given material. 5
4. Comment upon the spots. 5
5. Practical Record/Sessional 5
6. Internal evaluation 5

Suggested Readings

1. Kleinsmith, L.J. and Kish, V.M. 1995 Principles of Cell and Molecular Biology. Harper Collins College Publishers, New York, USA
2. Lodish, H. Berk, A. Zipursky, S.L. Matsudaira, P.Baltimore, D. and Darnell J.2000. Molecular Cell Biology. W.H.Freeman & Co. New York, USA
3. Baltimore. D. and Darnell, J.2000 Molecular Cell Biology. W.H. Freeman & Co. New York, USA
4. Gunning, B.E.S. and Steer M.W.1996. Plant Cell Biology, Structure and Function Jones and Bartlett Publishers Boston Massachusetts
5. Harris, N and Oparka, K.J.1994. Plant Cell Biology. A practical approach IRL Press Oxford U.K.
6. Sharma A.K. and Sharma. A 1999 Plant Chromosomes: Analysis, Manipulation and Engineering Harwood Academic Publishers Australia.
7. Watson, James D, T.A. Baker, S.P. Bell, A. Gann, M. Levine, R. Losick. 2004. Molecular Biology of the Gene, 5th edition, Pearson Education.
8. Gupta, P.K. 2006-07, Cell and Molecular Biology, 3rd edition, Rastogi Publication

Elective II – Chemistry
Paper II

Contact Periods/week: 05 + 4 Practical

Maximum Marks – 60
Min. Pass Marks – 20
Internal – 15 (Theory 10 & Practical 5)
Practical – 25 (External)

Note: Two questions will be set from each unit and students are required to attempt one question from each unit.

Objectives:

After the end of the 2nd semester the students should be able to:

* get the knowledge of basic concept of organic chemistry, like the tetravalency of Carbon, the concept of hybridization, the concept of resonance, hyperconjugation, and aromaticity.
* strengthen the knowledge regarding the nomenclature of organic compounds.
* explain the properties of organic compounds in terms of the structure of the functional groups.
* Acquire knowledge regarding the directional characteristics of covalent bond and discuss the stereochemistry of organic compounds centering around the directional characteristics of the covalent bond.

* highlight the importance of the study of kinetics in elucidation of mechanism of organic reactions.
* explain the reactions in organic chemistry in terms of free radical mechanism, substitution reactions, addition reactions and molecular rearrangement pattern.
* Acquire knowledge regarding the role of aryl radical as it affects the properties of organic compounds.
* develop competency to explain the chemistry of organic compounds in terms of comparative rystall of alkyl and aryl com
* Differentiate phenols and alcohols on the basis of their acidic and neutral behaviours.

Instructional Strategy:

The teacher while discussing the stereochemistry may use ball and stick model to focus the clarity in concept formation. While adopting the lecture technique, the teacher may make the presentation of subject matter interesting by adopting the structural approach (high lighting importance of reaction mechanism in the teaching of organic chemistry). In the subject treatment of open chain and closed chain compounds and alkyl and arlyl derivatives the teacher may take the help of comparative organizers (a type of advance organizer).

Unit-I: **Structure and Bonding**

Hybridization, bond lengths and bond angles, bond energy, localized and delocalized chemical bond, van der Walls interactions, inclusion compounds, clatherates, charge transfer complexes, resonance, hyperconjugation, aromaticity, inductive and field effects, hydrogen bonding.

Mechanism of Organic Reactions

Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, rystalli and heterolytic bond breaking.Types of organic reactions, Energy consideration.

Reactive intermediates (carbocations, carbanions, free radicals, carbenes, arynes and nitrene with examples). Assigning formal charges on intermediates and other ionic species.

Methods of determination of reaction mechanism (product analysis, intermediates, isotope effects, kinetic and stereochemical studies).

Stereochemistry of Organic Compounds

Concept of isomerism.Types of isomerism.

Optical isomerism-elements of symmetry, molecular chirality, enantiomers, sterogeniccentre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogeniccentres, diastereomers, threo and erythrodiastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization.

Relative and absolute configuration, sequence rules, D & L and R & S systems of nomenclature.

Geometric isomerism-determination of

configuration of geometric isomers. E & Z system of nomenclature, geometric isomerism in oximes and alicyclic compounds.

Conformational isomerism-conformational analysis of ethane and n-butane; conformations of

cyclohexane, axial and equatorial bonds, conformation of mono substituted cyclohexane, derivatives.

Newman projection and Sawhorse formulae, Fischer and flying wedge formulae.

Difference between configuration and conformation.

Unit-II: **Alkanes and Cycloalkanes**

IUPAC nomenclature of branched and unbranched alkanes, the alkyl group, classification of carbon atoms in alkanes.Isomerism in alkanes, sources, methods of formation (with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids), physical properties and chemical reactions of alkanes.

Mechanism of free radical rystallizati of alkanes ; orientation, reactivity and selectivity. Cycloalkanes-nomenclature, methods of formation, chemical reactions, Baeyer's strain theory and its limitations. Ring strain in small rings (cyclopropane and cyclobutane); theory of strainless rings. The case of cyclopropanering : banana bonds.

Arenes and Aromaticity

Nomenclature of benzene derivatives.The aryl group.Aromatic nucleus and side chain.

Structure of benzene : molecular formula and Kekule structure. Stability and carbon-carbon bond lengths of benzene, resonance structure, MO picture.

Aromaticity : the Huckel rule, aromatic ions. Aromatic electrophilic substitution-general pattern of the mechanism, role of (and complexes).Mechanism of nitration, rystallizati, sulphonationmercuration and Friedel-Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio.Side chain reactions of benzene derivative, Birch reduction.Methods of formation and chemical reactions of alkylbenzenes, alkyny benzenes and rystall.

Unit-III Alkenes, Cycloalkenes, Dienes and Alkynes

Nomenclature of alkenes, methods of formation, mechanisms of dehydration of alcohols and dehydrohalogenation of alky1 halides, regioselectivity in alcohol dehydration.The Saytzeff rule.Hofmann elimination, physical properties and relative stabilities of alkenes.

Chemical reactions of alkenes-mechanisms involved in hydrogenation, electrophilic and free redical additions, Markownikoff's rule, hydroboration-oxidation with $KmnO_4$, Polymerization of alkenes. Substitution at the allylic and vinylic positions of alkenes.Industrial applications of ethylene and propene. Methods of formation, conformation and chemical reactions of

cycloalkenes. Nomenclature and classification of dienes : isolated, conjugated and cumulated dienes. Structure of allenes and butadiene, methods of formation, polymerization.Chemical reactions-1, 2 and 1, 4 additions.Diels-Alder reaction.

Nomenclature, structure and bonding in alkynes. Methods of formation.Chemical reactions of alkynes, acidity of alkynes.Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation, metal-ammonia reductions, oxidation and polymerization.

Unit-IV: **Alkyl and Aryl Halides**

Nomenclature and classes of alky1 halides, methods of formation, chemical reactions. Mechanisms of nucleophilic substitution reactions of alky1 halides, S_N^2 and S_N^1 reactions with energy profile diagrams.

Polyhalogencompounds : chloroform, carbon tetrachloride.

Methods of formation of ary1 halides, nuclear and side chain reactions.The addition-elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions.Ralativereactivities of alky1 halides vs ally1, viny1 and ary1 halides.Synthesis and uses of DDT and BHC.Freons.

Unit-V Alcohols

Classification and nomenclature.Monohydric alcohols – nomenclature, methods of formation of reduction of aldehydes, ketones, carboxylic acids and esters.Hydrogen bonding.Acidic nature, Reactions of alcohols.

Dihydric alcohols – nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [Pb $(Oac)_4$ and HIO_4] and pinacol-pinacol one rearrangement. Tihydric alcohols – nomenclature and methods of formation, chemical reactions of glycerol.

Phenols

Nomenclature, structure and bonding, Preparation of phenols, physical properties and acidic character.Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion.Reactions of phenols-electrophillic aromatic substitution, acylation and carboxylation.Mechanisms of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, Hauben-Hoesch reaction, Lederer-Manasse reaction and Reimer-Tiemann reaction.

Practical:

1. Qualitative analysis of single organic compound.
2. One stage preparation and rystallization of three organic compound from the list given below –
   (a) Benzoyl chloride to Benzamide.
   (b) Aniline to Acetanilide.
   I Preparation of p-bromo acetanilide from acetanilide.
   (d) Benzoyalation of aniline.
   (e) Preparation of iodoform.
   (f) Benzamide to Banzoic acid.
3. Determination of molecular mass of organic compounds.

Scheme of Examination (Practical) **Time allotted – 5 hrs**

	Experiments		
(1)	Qualitative org. analysis	-	5
(2)	One stage preparation	-	5
(3)	Molecular mass determination	-	5
	Internal assessment	-	5
	Viva	-	5

Suggested Readings:

1. Paula YurkanicsBruice, Organic Chemistry, Pearson Education, Ltd.
2. Morison and Boyd, Organic Chemistry, Prentice Hall
3. Solomons and Fryhle, Organic Chemistry, WILEY International
4. Carey, Francis A., Organic Chemistry, Tata McGraw Hill
5. Eliel, Earnest, L., / Wilen, Samuel H., Stereo chemistry of organic compounds, John Willey & Sons, 2004.
6. Tiwari K.S., Vishnoi, N.K., A Test book of Organic Chemistry, VIKAS Publishing House.
7. Agarwal, O.P.,Organic Chemistry, Reactions and Reagents, Goel Publishing House, Meerut.
8. Bhal ,Arun&Bhal, B.S., Organic Chemistry, S. Chand & Company

Elective III – Zoology
Paper II: VERTEBRATES

Contact Periods/week: 05 + 4 Practical

Maximum Marks – 60
Min. Pass Marks – 20
Internal – 15 (Theory 10 & Practical 5)
Practical – 25 (External)

Note: Two questions will be set from each unit and students are required to attempt one question from each unit.

Objective:

To gain knowledge of classification of Vertebrates, their structure, organization, representative animals and comparative anatomy.

Unit-1

1. Classification of Vertebrata upto orders with examples.
2. Affinities and special characters of cyclostomes (comparison between *Petromyzon* and *Myxine*).
3. Elasmobranches – Type study of *Scoliodon*.
4. Teleosts – Type study of *Labeo*.
5. Air bladder and gills in fishes.

Unit-2

1. Amphibia- Type study of frog
2. Parental care, neoteny and metamorphosis in amphibians.
3. Reptilia – Type study of *Uromastix*.
4. Anatomical peculiarities in snake.
5. Biting mechanism and poison apparatus in snakes.

Unit-3

1. Aves-Type study of pigeon.
2. Flight and perching mechanism in birds.
3. Mammalia – Type study of rabbits.
4. Affinities of Prototheria and Metatheria.

Unit- 4

Comparative anatomy from Pisces to Mammalia

1. Comparative study of integumentary system and study of integumentary derivatives (scales, feathers, horns and hooves).
2. Comparative study of digestive system.
3. Comparative study of respiratory system.

4. Comparative study of heart and aortic arches.
5. Comparative study of urinogenital system.
6. Comparative study of brain.

Unit-5

Comparative study of endoskeleton from Amphibia to Mammalia.

1. Skull
2. Limb Bones and Girdles.
3. Vertebrae.
4. Special endoskeletal structures (urostyle, astragalas, calcanium, synsacrum, pygostyle)

PRACTICAL

Objective- To study and develop skill of identification of animals, their histology, comparison of anatomy, physiology and their osteology.

1. Study of museum specimen, slides, relevant to the theory from Cyclostomes to Mammalia.
2. Permanent slide preparation- scales of fishes.
3. Comparative study of integument, digestive tract and blood cells of vertebrates through permanent slides.
4. Comparative study of brain of different vertebrates through charts and models.
5. Comparative vertebrate osteology e.g frog, fowl, rabbit (skull, limb bones, girdles, special bones, vertebrae)
6. Comparative study of heart and aortic arches, respiratory system and urinogenital system through charts and models.

SCHEME OF PRACTICAL EXAMINATION

1.	Spotting	-	10
2.	Mounting	-	03
3.	Exercise based on bones	-	05
4.	Practical Records	-	03
5.	Viva-voce	-	04
	Total	**-**	**25 Marks**

Referred books -:

1. Textbook Of Zoology Vol II (Vertebrate)-Parker & Haswell
2. Animal Biology (Vol II) –Adhikari, Ganguly & Sinha
3. Textbook of Vertebrates- R.L Kotpal
4. Chordates –Jordan and Verma.
5. Zoology of Chordates –Nigam H.C
6. Comparative anatomy of Vertebrates – Kent
7. Outline of comparative anatomy of vertebrates – Kingsley.
8. Element of chordates anatomy – Weichert.
9. Practical Zoology Vertebrates –S.S.Lal
10. Practical Zoology of Chordates –P.S. Verma

Elective III – Mathematics

Contact Periods/week: 05 + 4 Practicum

Maximum Marks – 30+30=60
Min. Pass Marks – 20
Internal – 15 (Theory 10 & Practicum 5)
Practicum – 25 (Internal)

M -2.1 DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

NOTE : Two questions will be set from each unit with Internal choice

Objectives :

- To develop understanding of Differential Equations and their applications
- To develop understanding of basic concepts of Vector Integration
- To enable them to solve the problems based on Green,Gauss and Stokes

Unit – I Degree and order of differential equation. Equations of first order and first degree. Equations in which the variables are separable. Homogeneous equations.

Unit – II Linear equations and equations reducible to the linear form. Exact differential equations. First order higher degree equations solvable for x, y, p. Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Orthogonal trajectories.

Unit – III Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations. Linear differential equations of second order. Transormation of the equation by changing the dependent variable/ the independent variable.

Unit – IV Method of variation of parameters. Ordinary simultaneous differential equations.

Unit –V Vector Integration, Gauss Theorem, Theorems of Green, Gauss, Stokes and problems based on these.

Content as in :

- Danial Murray: Introductory Course in Differential Equations . Orient Long Man.
- Manglik and Seth Vector Calculus
- B.R. Thakur, Nigam, Sinha and Saren - Vector Analysis

M – 2.2: 3-D GEOMETRY

NOTE: Two questions will be set from each unit with internal choice

Objectives:

- To develop understanding of conicoids
- To develop the ability to reduce second degree equation in 3-Dimensions
- To develop ability to treat general equation of second degree including con-focal conics
- To make them familiar with the mechanism of deriving equations of surfaces in 3-dimensions.
- To enable them to treat conics in polar form

Unit-I General equation of second degree, Tracing of conics, system of conics, confocal conics

Unit-II Polar equation of a conic.

Unit – III Central Conicoids, Paraboloids

Unit – IV Plane sections of coincoids, Generating lines, Confocal Conicoids

Unit – V Reduction of second degree equations.

Content as in:

5. R.J.T. Bell : Elementary Treatise on Coordinate Geometry of 3-Dimension Mc. Milan

M – 2.3 Mathematics Practicum

.**List of Activities:**

- Activity oriented problem solving / Experiments using Mathematical software or computer programming language based on the content studied in semester II Mathematics papers M-2.1 and M-2.2.
- Mathematics seminar.

Education Component:

Cognition and Learning

Contact Periods/week: 03

Maximum Marks – 40
Min. Pass Marks – 13
Internal – 10

Objectives

- Explore the possibilities of an understanding of processes in human cognition and meaning–making them as basis for designing learning environments and experiences at school
- To become aware of different contexts of learning and situate schools as a specialenvironment for learning
- To develop awareness of the different contexts of learning.
- To reflect on their own implicit understanding of the nature and kinds of learning;

- Gain an understanding of different theoretical perspectives on learning with afocus on cognitive views of learning as well as social– constructivist theories;
- Appreciate the critical role of learner's based on differences and contexts in making meanings, and hence draw out implications for schools and teachers.

UNIT1: COGNITION

- Meaning of Cognitionand its Role in learning
- Structure and Process of Cognition:sensation, perception, attention, memory, concept formation and problem-solving in learning.
- Socio-cultural factors that influence cognition

UNIT 2:THEORETICAL PERSPECTIVES ON LEARNING

- Implicit knowledge and beliefs about learning (demystifying misconceptions).
- Perspectives on human learning: Behaviourist (conditioning paradigm in brief), cognitivist, information-processing view, humanist, social-constructivist (drawing selectively on the ideas of Skinner, Piaget, Rogers, Vygotsky).
- Concepts and principles of each perspective and their applicability in different learning situations.

UNIT 3: ROLE OF LEARNER IN LEARNING

- Role of learner in various learning situations, as seen in different theoretical perspectives
- Role of teacher in teaching-learning situations: a) transmitter of knowledge, b) model, c) facilitator, d) negotiator, e) co-learner. (The focus is on building understanding of different psychological perspectives of learning and helping student teachers to learn to apply them in different learning situations)
- Distinctions between learning as 'construction of knowledge' and learning as 'transmission and reception of knowledge'.

UNIT 4: INDIVIDUAL DIFFERENCES AMONG LEARNERAS

- Dimensions of differences in psychological attributes—cognitive abilities, interest, aptitude, creativity, personality, values.
- Understanding learners from multiple intelligences perspective with a focus on Gardner's theory of multiple intelligences including emotional intelligence.
- Differences in learners based on socio-cultural contexts
- Understanding differences based on a range of cognitive abilities— learning difficulties, slow learners and dyslexics, intellectual deficiency, intellectual giftedness and implications for classroom practices and teaching.

Suggested Sessional Work

- Reflective Written Assignments – comments and grade
- Field observation notes – comments and grade
- Participation in discussions – to be assessed qualitatively (along a set of rubrics)
- Analysis of a learning situation and case study, using theoretical perspectives – to assess for conceptual grasp and clarity of analysis – comments, further questions, grade
- A written test can be given on 'conceptual grasp' of theories of teaching, learning and cognition, as well as 'working understanding' of constructivist approach to construction of knowledge – evaluated with marks

- Assignment on the implications of Piaget/Vygotsky/Ausubel's approach to teaching-learning
- Student panel discussion of selected themes.
- Class presentations
- Readings and class discussions
- Assignments

Suggested Reading

- Atkinson, Richard C. et.al. (1983). Introduction to Psychology. Harcourt Brace Johanovich Inc. New York,
- Aggarwal, J.C. Essential of Educational Psychology, Vikas Publishing House, New Delhi, 1994.
- Aggarwal, J.C. Essential of Educational Psychology, Vikas Publishers, Delhi, 1998
- Benjafield, J.G. (1992). Cognition, Prentice Hall, Englewood Cliffs.
- Bereday, George, F., and Lanwery Joseph (1963). Educational and Training of Teacher, Trens. Brother Ltd. London.
- Bhargava, Mahesh, Introduction of Exceptional Children, Sterling Publishers, New Delhi, 1994.
- Bhatia, H.R., A Text Book of Educational Psychology, Delhi: McMillan Co., New Delhi, 1977
- Bhatia, K.K. Educational Psychology and Techniques for Teaching, Kalyani Publishers, Ludhiana, 1994.
- Brown, J.S., Collins A and Dugrid, P (1989). Situated Cognition and the Culture of Learning, Educational Researcher; 32-42.
- Chauhan, S.S. Advanced Educational Psychology, Vikas Publishing New Delhi, 1996
- Gage, N.L. (1964). Theories of Teaching. In Theories of Learning and Instruction, NSSE University Press Year Book, Chicago.
- Gagné, R. M. (1985) The Conditions of Learning and Theory of Instruction (4th edition). New York: Holt, Rinehart and Winston
- Gardner, H. (1999) The disciplined mind: What all students should understand. New York: Simon & Schuster
- Gardner, Howard (1989). Frames of Mind. The Theory of Multiple Intelligences, Basic Books, New York.
- Gardner, Howard (1991). The Unschooled Mind, Basic Books, New York.
- Haas, KB and Packer, HQ: Preparation and use of Audio-Visual Aids, Prentice Hall, Inc. 1990
- Jeanne Ellis Ormrod Educational Psychology: Developing Learners. Fourth Edition
- Kundu, C.L. and Tutoo, D.N., Educational Psychology, Sterling Publishers, New Delhi, 1980.
- Kundu, V.L and Totoo, D.N., Educational Psychology, Sterling Publishers, New Delhi.
- Kolb, D.A. (1984) Experiential Learning. Engelwood Cliffs, NJ: Prentice-Hall
- Lindgren, H.C. (1980). Educational Psychology in the Classroom Oxford University Press, New York.
- Luria, A.R. (1976). Cognitive Development: Its Cultural and Social Foundations. Havward University Press, Cambridge, Mass.
- Mangal, S.K. Advanced Educational Psychology, Prentice Hall of India. Pvt. Ltd., 1999
- Mathur, S.S., Educational Psychology, 9th Ed., VinodPustakMandir, Agra, 1981
- Patricia A. Alexander, Philip H. Winne (2006) Handbook of Educational Psychology
- Rogers, C.R. (1983) Freedom to Learn (revised edition). Columbus, OH: Merrill
- Rosser, Rosemary A. (1993). Cognitive Development: Psychological and Biological Perspectives, AllyndandBacon:USA
- Sarangapani M. Padma(2003.), Constructing School Knowledge :An Ethnography of learning in an Indian Village, Sage Publication

- Sharma, R.A. (1983). Technology of Teaching; International Publishing House, Meerut.
- Sibia, A. (2006) : Life at Mirambika, NCERT, New Delhi
- Storm, Robert D. (1971). Teaching and Learning Process, Prentice Hall Inc. Englewood Ciffs, New Jersey.
- Sturt Mary, Oakden, E.C. (1999) Modern Psychology and Education, Routledge.
- Shivashankara H.V. and Basakumar P., ShaikshanikaManovijnana, HanjiPrakashanaDavangere, 1977
- Skinner, C.E. (Ed) Educational Psychology, 4th Ed., Prentice Hall of India Pvt., Ltd., New Delhi, 1996
- Thorndike Edward L. (2007) Educational Psychology, Published by READ Books.
- Vygotsky, L.S. (1978). Mind in Society. The Developemnt of Higher Psychological Process.Havward University Press, Cambridge.
- Vygotsky, L.S. Mind in Society, Harvard University Press: Cambridge, 1978. Chapter 6.
- Wertsch, J.V. (1985) Vygotsky and the Social Formation of Mind. Harvard University Press
- Wertsch, J.V. (1985). Culture, Communication and Cognition.Vygotskian Perspectives, Cambridge University Press, Cambride.
- Walia, J.S. Foundation of Educational Psychology, Paul Publishers, Jalandhar, 2001
- White, William, L. (1969). Psychological Principles Applied to Classroom Teaching McGraw Hill, New York.
- Wolfolk , Educational Psychology, Prentice Hall: Eaglewood Cliff,1987
- Woolfolk, A.E. (2009) Educational Psychology (11th Edition) (My Education Lab Series) Prentice Hall

Psychology Practical

Contact Periods/week: 03

Maximum Marks – 25
Min. Pass Marks – 08
Internal – 25

Any five from the following:

I. Intelligence (Verbal, Non-Verbal and Performance Tests)
II. Personality
III. Creativity
IV. Motivation
V. Learning
VI. Concept Formation
VII. Problem Solving

Health, Physical Education & Yoga –II

Contact Periods/week: 2 Practical

Maximum Marks – 25
Min. Pass Marks – 08
Internal – 25

Unit I

Programme of Physical Fitness and Muscular Development (Free Hand and Callisthenic Exercise) : Circuit Training and Weight Training.

Unit II

Athletics is Printing and Distance Running- Crouch Start, Striding, Curve Running and Finishing Technique.

Jumps- Approach Run, Take off, Clearance and Landing.

Throws- Hold/Grip, Placement/Swing, Stance, Action, Releasing and Recovery.

Unit III

Layout and Marking of Track and Field and Different Play Grounds.

Unit IV

Teaching Skills of Major Games, Teaching Rules, Officiating and Organizing Tournaments of Major Games.

-Cricket,Football,Kbaddi,Kho-Kho,Volleyball,Basketball,Table-Tennis,Lawn-Tennis,Badminton
-Instruction and demonstration of basic skills
-Equipments and dimensions of play fields
-Comman rules and interpretation
-Organization and conduct of tournament/competition.

Unit V

Teaching/lesson in physical education and sports (skills)

Art & Aesthetic

Contact Periods/week: 02

Maximum Marks – 25
Min. Pass Marks – 08
Internal – 25

Introduction:

The need of integrate arts education in the formal schooling of our students is to retain our unique cultural identity in all its diversity and richness and encourage little children and creative minds to do the arts. An understanding of the arts and aesthetics will give our children to give ability to appreciate the richness and variety of artistic traditions as well as make them liberal, creative thinker and after all a good citizen of the nation.

In National Curriculum frame work (2000, 2005) and National Education Policy introduced arts education as a mainstream curricular area, which must be taught in every elementary and primary schools as a compulsory subject up to secondary level, keeping this in view, its all the more important that arts education is integrated in the school curriculum to provide an aesthetically viable atmosphere in elementary levels encouraging creativity. For this, not only the art teachers but every teacher should be sensitive to appreciate this.

Aim:

Teaching Arts education in elementary and school may be perceived as a tool for development of aesthetics sensitivity among learners to enable them to respond to the beauty in different form of arts. For effectiveness and interest of teaching, curricular area of arts education are required. Some broader objectives are follow-

- **Objectives:**
  - अध्ययन–अध्यापन प्रक्रिया को कला के माध्यम से रोचक बनाना।
  - शिक्षण–अधिगम के दौरान आसपास के माहोल, विद्यालय, घर–ससुराल को स्वच्छ एवं सुन्दर रखने हेतू कलात्मक कार्य की प्रेरणा देना।
  - सीखने–सीखाने हेतू सौंदर्य, संवेदना एवं कल्पनाशीलता का समन्वय करना।
  - कलात्मक द्रष्टिकोण एवं सांस्कृतिक घटकों की समझ हेतू अवसर उपलब्ध करवाना।
  - अध्यता–अध्यापक के माध्यम से कलाएं तथा प्रवृति लक्ष्मी वातावरण के निर्माण से विषयबोध प्राप्त करना।
  - प्रकृति–परिवेश, पर्यावरण और गणित जैसे विषयों को विभिन्न कलाओं के माध्यम से सीखने को अवसर प्रदान करना।
  - अध्ययन प्रक्रिया में कलाओं को जोड़कर कार्यानुभव प्राप्त करना।
  - सृजनात्मकता एवं सौंदर्यबोध के अविषकार से नैतिक एवं राष्ट्रीय भावनाओं का विकास करना।
  - चित्रकायँ, गायन, शिल्प–स्थापत्य एवं अन्य दृश्य–श्राव्य काठाओं को टेक्नोलॉजी के माध्यम से समझना एवं नवाचार सीखना।

- ➢ कलाओं के साथ अन्य विषयों के समन्वय से राष्ट्रीय धरोहर एवं संस्कृति के प्रति लगाव पैदा करना।
- ➢ विभिन्न कलाकारों और उनके जीवन को जानना।

COURSE – CONTENT

Unit-1: Art Concept of Art Education-

- क्लाओं का महत्व क्यों समझना है। कलाओं का जीवन में स्थान। कलाओं से जीवनयापन आदि।
- कला और शिक्षा –
  - कला शिक्षण और कलाओं के साथ समन्वित शिक्षण।
  - कला के क्षेत्र (work), विस्तार।

Unit-2: Visual Art: (Visual)

- रेखाचित्र, रंगकायें, स्केचिंग, छाप कार्य, भीत्री चित्र आदि और उनके प्रकार। चित्रकार्य हेतु उनकी गतिविधियाँ।
  - चित्रकारी एवं क्राफ्ट जैसी कलायें सीखने में कैसे सहायक होती है?
  - इसे पर्यावरण,, भाषाएं, विज्ञान, गणित जैसे विषयों के साथ जोड़ना।
  - अनेक गतिविधियों से कला एवं सौंदर्यबोध आत्मसात करना।

Unit-3:

- अभिनय, रंगमंच, साज सज्जा, नाटक के संवाद, अभिव्यक्ति, संगीत, लोक नाटक, को समझना व प्रयुक्त करना।
- नाटक की ऐतिहासिक प्रष्ठभूमि, भारतीय व पाश्वात्य अवधारणा।
- नाटक, अभिनय गीत, नृत्य गीत, खेल, व्यायाम, योग, व्यक्तित्त्व विकास एवं क्लासरूम शिक्षा को जोड़ना।

❖ **Activities & Assignments-**

1. विभिन्न कलाओं के बारे में जाने तथा उसके नमूनों का संग्रह करें।
2. प्राथमिक,उच्च प्राथमिक, माध्यमिक कक्षाओं के पाठयपुस्तकों में नर्सरी, जिस क्लास की बात हुई उसकी list बनायें। साथ ही उनके चित्र, मूर्तियां आदि के picture इकट्ठा करें।
3. अपने क्षेत्र में प्रचलित लोककलाएं जैसे मांडना, भीत्रिचित्र, गोंदना, मेंहदी, महावर, गौंडी, वारली, रंगोली, आदि के चित्र इकट्ठा करके छात्रों से प्रवृत्रि करवाएं।
4. अपने क्षेत्र में पाई जानेवाली सांस्कृतिक धरोहरों ;मूर्तिकला, काष्ठकला, छापाकला, स्टोन ।तज शिल्प–स्थापत्यों के बारे में जानकारी लेकर सूचि बनाएंगे तथा उनके स्थानीय कलाकारों से भेंट करवायेंगे। (Experience) list
5. अपने क्षेत्र एवं भारत के प्रचलित लोकनृत्य और लोकगीतों की जानकारी ओडियो, विडियों एवं प्ब्ज के माध्यम से प्राप्त करना तथा स्थानीय कलाकार से वार्तालाव करना। (Documentation of Arts, Dance/Folk lore etc.)
6. नाटक, रोलप्ले, एकांकी, एक पात्रीय अभिनय, अभिनय गीत, आदि को वर्गखण्ड के विषयवस्तु के साथ Integrate करके मंचन करें।
7. सामूहिक अभिनय, अभिनय गान, सामूहिक गान, सामूहिक नृत्य आदि ;चतंबजपबंससलद्ध करवायें। नाटक हेतू व्यायाम, योगा, मौखिक अभिव्यक्ति, संगीत पसन्द करें।
8. रागों का परिचय एवं प्रायोगिक कार्य करवा सकते हैं।
9. Arts dks ICT ds lkFk Integrate djds Practical work dj ldrs gSaA

❖ **Projects:**

i. विविध कलाओं के बारे में सूचि बनाएं तथा कलाकारों से वार्तालाप करें।
ii. परिसंवाद, चर्चा, इन्टरव्यु का आयोजन करें जिसमें क्षेत्रीय कलाकारों से मुलाकात हो सके।
iii. नाटकों को वाचन, मंचन करवायें। (Reading and Acting)
iv. संस्कृतिक संग्रहालय, क्षेत्रों की फिल्ड मुलाकात का आयोजन करें एवं एसाइन्टमेन्ट तथा प्रोजेक्ट कार्य करें। (Field visit/Report)

v. जनजातीय, लोककलाएं, भीत्रिचित्र, छापकलाएं, मूर्तिकला, वुडनआर्ट, ग्लास (Glass Painting) डीजिटल आर्ट, प्राचीन एवं मोर्डन आर्ट, फेब्रिक कलाएं, आदि के बारें में ग्रुप में च्तवरमबज दे सकते हैं। (Research based Projects)

❖ **Reference:-**

i. NCF- 2005
ii. Position papers of Arts and Craft and Drama, Music
iii. Basic Education
iv. f'k{kk dk ogu&dyk& nsohizlkn
v. dyk dkjhxjh dh f'k{kk&Hkkx-I/II fxtwHkkbZ c/kdsA
vi. Wikipedia- Art Education
vii. Learning Cerve, Art Education volume.
viii. Pkded if=dk] dyk le;] paid] NCERT dh if=dk vkfnA
ix. Drama and Theatre in Education, Dodd, Nigel and Winifred Hickson (1980).
x. Kabad se Jugad: Little Science- Arvind Gupta, Eklavya.
xi. Joy of making Indian Toys, Popular Science, S. Khanna (1992) New Delhi, NBT.
xii. Creative Drama in the primary Grade, Vol-I/II, McCaslin, Nellie 1997, London, Longwan.
xiii. Learning through Art, Sahi, Jain & Sahi, Eklavya, 2009.
xiv. Deevaswapna, Gujabhai Badheka, Indore.

❖ **Websites:-**

i. www.Art integrated learning/Edu./primary
ii. www.Basic Education through Art
iii. www.Indian Arts and Culture
iv. www.Youtube/Art/Primary education
v. DD Bharti- Arts & Culture, www.dalbharti.dd.org.in.

Work Education II
Option I: Electricity and Electronics

Contact Periods/week: 2 Practical

Maximum Marks – 25
Min. Pass Marks – 08
Internal – 25

Syllabus:

Unit 1: Electrical and Electronics measurement and measuring Instrument

Introduction, use, type (based on working and construction) and connections of Ammeter, voltmeter, wattmeter, frequency meter, power factor meter, meager, ohmmeter, Energy meter and Multi-meter. Measuring technique and precaution during their operation in electrical circuit. . Introduction of multi-meter and method of its uses, testing of electrical appliances using multi-meter, Principle of fault location and demonstration using multi-meter.

Unit 2: Basic Electronics

Conductor, Insulator and Semiconductor materials, extrinsic and intrinsic semiconductor materials, P-Type and N-Type Semiconductor material, doping, formation of P-N junction diode, forward, and reverse biasing of diode, characteristic and application. Formation of P-N-P and N-P-N junction transistor, biasing of transistor, characteristic, and their application. Soldering – Principle, method, and materials. Practice of soldering.

Unit 3: Electronics component and Materials

Study of electronic components-sign and symbols recognition, specification and testing of components like resistors, capacitors, coil, diode, transistor, zener diode, photo diode, LED, solar cell, P.C. Board, bread board, I.C. (Integrated circuits) using multimeter. Integrated circuits fabrication – Advantages and limitations of I.Cs.

Unit 4: Construction of common Electronics Circuit

Construction of eight L.E.D. disco light, Testing of disco light checking individual components, Construction of battery eliminator. (using half wave/full wave circuit), Testing of battery eliminator,

checking individual components, Simple construction of fire alarm (using photocell), Construction of audio amplifier, Construction of oscillator, Construction of Musical bell, Construction of Simple emergency light, Regulated power supply, Testing of musical bell, emergency light, amplifier and oscillator by measuring voltages, Construction of light operated switch. PAS (Public Address System)-(a) Components of PAS and their specification. (b) Demonstration – Installation (c) Connectors used with microphones (d) Locating and repairing of minor faults in PAS.

Unit 5: Repairing of Home Appliances

House appliance repairing like Electrical Press, Heater, Immersion Rod, Electrical Kettle, Fan, Cooler, and Mixer, Rewire the fuse, To find the fault in above electrical appliances and rectify them, Outline the principles of working of Washing Machine and locating faults, Microwave – Outline the working principle and maintenance of a microwave. To study the construction, working and maintenance of different types of electrical motors.

Distribution of marks:

- Internal Exam – 10 marks
- Practical Exam - 10 marks
- Record and Viva Vice - 05

(Suggested Readings as given in I Semester)I

WORK EDUCATION- II

Option II: Agriculture – KITCHEN GARDENING & FRUIT PRESERVATION

Syllabus:

Unit–I Kitchen gardening – Importance, Establishment & Management.

Unit–II Identification and cultivation of vegetable crops suitable for kitchen gardening viz: Pea, Carrot, Onion, Okra, Chilli and Radiishetc. Identification and cultivation of Fruit crops suitable for kitchen gardening viz: Citrus, Papaya, Banana, Grapes and Mango etc.

Unit-III Applied knowledge of common manures, fertilizers their uses and methods of application, Identification knowledge of common pesticides and their uses in kitchen garden.

Unit-IV Fruit Preservation – Principles of Fruit preservation, Different methods of fruit preservation, Causes of Spoilage and their remedies

Unit-V Preparation of some fruit products; Jam, Jelly, Squashes, Ketchup & Pickles.

SCHEME OF EXAMINATION (25 marks)

1. Identification of seasonal vegetables and Fruit Crops with comments - 05 marks
2. Drawing layout Plan of a Kitchen Garden - 05 marks
3 Principles and different methods of fruit preservation - 05 marks
4. Preparation method of Jam, Jelly, Ketchup, Sauce and Pickles , - 05 marks
5. Viva and Practical Record - 05 marks

Suggested Readings:

1. Handbook of Horticulture; I.C.A.R., New Delhi
2. Preservation of fruits and vegetables, GirdharlalSidhapa; I.C.A.R., New Delhi
3 Fruit & vegetable preservation industries in india, Bhutani, R.C. ; C.F.T.R.I.; Mysore..
4. Vegetable production in india, Chauhan, D.V.S.; Ram Prasad and Sons, Agra.
5. Commercial fruits; Singh, S.P.; Kalyani Publishers, New Delhi.
6. Instant Horticulture; Gupta, S.N.; Naik, K.B; Jain Brothers, New Delhi.