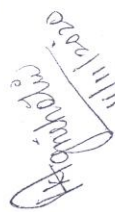

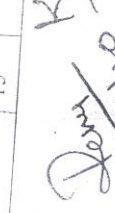
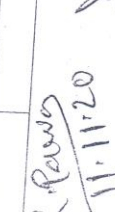




B.Sc.B.Ed. IV SEM. [CORE COURSE]
MARKS DISTRIBUTION OF B.Sc.-B.Ed. FOUR YEARS INTEGRATED COURSE

Section	Paper	Subject	Total Marks	External Marks		Exam Pattern	Internal Marks		Marks Distribution	Remark
				Max	Min		Max	Min		
Foundation part	F-1	Moral Values & Language-I	75	50	20	Written Exam by University	25	10	COLLEGE SEND THIS MARKS DIRECTLY TO UNIVERSITY	
	F-2	Environmental Studies	75	50	20		25	10		
	S-1	Any three subject from given list	100	75	30		25	10		
Science part	S-2	Phy, Chem., Botany, Zoology, Maths	100	75	30	Written Exam by University	25	10	COLLEGE SEND THIS MARKS DIRECTLY TO UNIVERSITY	
	S-3	*Subject specified in the scheme by board of studies will only be considered	100	75	30		25	10		
		*Note: in case of mathematics, theory	150	125	50		25	10		
Education part	CC-7	Educational Technology & ICT	100	75	30	Written Exam by University	25	10	COLLEGE SEND THIS MARKS DIRECTLY TO UNIVERSITY	
			650							

Practical

SCIENCE PART	PS-1/2/3	According to selection of subject in S-1, S-2 & S-3	50 each		Practical Exam by external Appointed by University		Practical Examiners and Internal (who teaches subject) send this marks after Practical exam with total 50 marks
		TOTAL	100/150				
		Theory total	650				
		Practical total	150				
Education Part		Total	800				
	EPCII	Drama and Arts in Education	50	35		15	

 11/11/20
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 11/11/20

DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class	:	B.A./B.Sc./B.Com./B.H.Sc.II Year
Semester	:	IV
Subject	:	Foundation Course (आधार पाठ्यक्रम)
Paper	:	I
Title of Paper	:	नैतिक मूल्य और भाषा (Moral Values & Language)
Compulsory/ Optional	:	Compulsory
Max. Marks	:	75 (83) (Moral Education- 15, Hindi- 35, English- 35)

Particulars

30

20

Part - A

30

Unit - 1	नैतिक मूल्य 1. भारतीय संविधान की प्रस्तावना 2. नागरिक के अधिकार और कर्तव्य 3. राज्य की नीति के नीति-निदेशक तत्व	15
Unit - 2	हिन्दी भाषा 1. दिमागी गुलामी (निबंध) - राहुल सांकृत्यायन 2. फॉस (कहानी) - गोविन्द मिश्र 3. हमारा सीर मण्डल (संकलित) 4. जीवन : उत्पत्ति और संरचना (संकलित) 5. विराम चिन्ह - उपयोग और प्रयोग (संकलित)	17
Unit - 3	हिन्दी भाषा 1. इन्द्रधनुष का रहस्य (वैज्ञानिक लेख) - डॉ. कपूरमल जैन 2. चली फगुनहट बौरे आम (ललित निबंध) - विवेकी राय 3. भोजन और स्वास्थ्य (संकलित) 4. निबंध रचना (संकलित) 5. संज्ञितियाँ (संकलित)	18
Part - B		20
Unit - 4	English Language 1. Three Questions : C. Rajgopalachari 2. Ramanujan : C.P. Snow 3. The Power of W.E. : Roger Rosenblatt 4. A Short Extract from the Naked Ape : Desmond Morris	17
Unit - 5	English Language Narrative skills - narration of events and situations. Production of speech : Classification of sounds. Correction of common errors in th sentence structure, Drafting C.V. Basic language skills : Tenses, prepositions, determiners, verbs & Articles, Nouns & Pronouns.	18

* सैद्धांतिक परीक्षा हेतु उपरोक्तानुसार 85 (15+35+35) अंक और आन्तरिक मूल्यांकन (सीरीस) हेतु पृथक से 15 (5+5+5) अंक निर्धारित हैं।

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DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class	-	B.A./B.Sc./B.Com./B.H.Sc./BCA II
Subject	-	Foundation Course
Paper Title	-	Paper II : Environmental Studies
Semester	-	IV

Max. Marks- Theory 35+15 CCE

Unit - I Problem of natural resources

- Problem of water resources – Utilization of surface and ground water, over utilization, flood, drought, conflicts over water, dams-benefits and problem.
- Problems of forest resources – uses and over utilization, deforestation, utilization of timber, non-wood forest products, dams and its effect on forests.
- Problems of land resources – Land as a source, erosion of land, man-induced landslides and desertification.

Unit- II Bio-diversity and its protection –

- Introduction- Genetic, species and ecosystem diversity
- Value of bio-diversity – Consumable use: Productive use, Social, moral and aesthetic values.
- India as a nation of mega bio-diversity centre, bio-diversity at national and local levels.
- Threats to bio-diversity – Loss of habitat, poaching of wildlife, man-wildlife conflicts.

Unit- III Human Population and Environment

- Population growth, disparities between countries.
- Population explosion, family welfare Programme.
- Environment and human health.

Unit - IV Ecology and Ecosystem

- (a) Ecology-Introduction
- (b) Ecosystem- Concepts, components, structure & function, energy flow, food chain, food web, ecological pyramids and types.

Unit - V Environmental Wealth

- (a) Main rivers of India and grasslands
- (b) Rural, Industrial, Agricultural fields.
- (c) Study of common plants, insects and birds.

Reference Book : Text Book for Environmental Studies – University Grants Commission, New Delhi & Bharati Vidyapeeth institute of Environment Education and Research, Pune

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DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class	-	बी.ए./बी.कॉम./बी.एस.सी./बी.एस.सी. गृह विज्ञान/ बी.सी.ए.
Subject	-	आधार पाठ्यक्रम
Paper Title	-	पेपर II: पर्यावरणीय अध्ययन
Semester	-	IV

कुल अंक- थ्योरी 35 + 15 सी.सी.ई.

इकाई-1 प्राकृतिक संसाधन की समस्याएँ

- (क) जल संसाधन की समस्या-सतह एवं भूजल का उपयोग, अतिदोहन, बाढ़, सूखा, जल पर संघर्ष, बाँध-लाम एवं समस्याएँ।
- (ख) वन संसाधन की समस्याएँ- उपयोग एवं अतिदोहन, वनोन्मूलन, इमारती लकड़ी, अकाष्ठ वनोत्पाद, बाँध एवं उनका वन पर प्रभाव।
- (ग) भूमि संसाधन की समस्याएँ- स्रोत के क्रय में भूमि, भूमि का अवभ्रमण, मानव प्रेरित भू-स्खलन और मरुस्थलीकरण

इकाई-2 जैव विविधता और उसका संरक्षण-

- (क) प्रस्तावना : अनुवांशिक, जातीय तथा पारिस्थितिक विविधता
- (ख) जैव विविधता का मूल्य - उपभोग्य उपयोग, उत्पादक उपयोग, सामाजिक, नैतिक तथा सौन्दर्यगत मूल्य
- (ग) वृहत जैवविविधता केन्द्र के राष्ट्र रूप में भारत, राष्ट्रीय तथा स्थानीय स्तरों पर जैव विविधता।
- (घ) जैव विविधता के खतरे- आवासीय हानि, वन्य जीवन में अनधिकार घुसपैठ तथा मानव, वन्य जीवन-संघर्ष।

इकाई-3 जनसंख्या तथा पर्यावरण

- (क) जनसंख्या-वृद्धि, राष्ट्रों के बीच अन्तर
- (ख) जनसंख्या-विस्फोट, परिवार कल्याण कार्यक्रम
- (ग) पर्यावरण और मानव स्वास्थ्य

इकाई-4 पारिस्थितिकी तथा पारिस्थितिकी तंत्र

- (क) पारिस्थितिकी - प्रस्तावना
- (ख) पारिस्थितिक तन्त्र- अवधारणा, घटक, संरचना तथा कार्यप्रणाली, ऊर्जा का प्रवाह, खाद्य श्रृंखला, खाद्य जाल, पारिस्थितिक पिरामिड तथा प्रकार

इकाई-5 पर्यावरण सम्पदा

- (क) भारत की प्रमुख नदियां तथा घास के मैदान
- (ख) ग्रामीण, औद्योगिक एवं कृषि क्षेत्र
- (ग) सामान्य पौधे, कीटों एवं पक्षियों का अध्ययन

संदर्भ पुस्तक— मध्यप्रदेश हिन्दी ग्रंथ अकादमी, भोपाल द्वारा प्रकाशित पुस्तक

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DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class: B.Sc.

Max. Marks: 85 + (CCE) 15 = 100

Semester : IV

Subject : Physics

Title of Paper : Electrostatics, Magnetostatics and Electrodynamics

Unit-1

[15 Lectures]

Electrostatics

Coulombs law in vacuum expressed in vector forms, calculations of electric field \mathbf{E} for simple distributions of charge at rest, dipole and quadruple fields. Work done on a charge in an electrostatic field expressed as a line integral, conservative nature of the electrostatic field. Relation between electric field & electric potential ($\mathbf{E} = -\nabla V$), torque on a dipole in a uniform electric field and its energy, flux of the electric field, Gauss's law and its application for finding \mathbf{E} for symmetric charge distributions, Gaussian pillbox, fields at a surface of a conductor, screening of \mathbf{E} field by a conductor.

Capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field, point charge in front of a grounded infinite conductor. Dielectrics, parallel plate capacitor with a dielectric, dielectric constant, polarization and polarization vector \mathbf{P} , relation between displacement vector \mathbf{D} , \mathbf{E} and \mathbf{P} . Molecular interpretation of Clausius-Mössotti equation, boundary conditions satisfied by \mathbf{E} and \mathbf{D} at the interface between two homogenous dielectrics, illustration through a simple example.

Unit-2

[15 Lectures]

Magnetostatics

Force on a moving charge, Lorentz force equation and definition of \mathbf{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 and Savart's law, calculation of \mathbf{H} for simple geometrical situations such as Solenoid, Anchor ring. Ampere's Law, $\nabla \times \mathbf{B} = \mu_0 \mathbf{J}$, $\nabla \cdot \mathbf{B} = 0$. Field due to a magnetic dipole, free and bound currents, magnetization vector (\mathbf{M}), relationship between \mathbf{B} , \mathbf{H} and \mathbf{M} . Derivation of the relation $\nabla \times \mathbf{M} = \mathbf{J}$ for non-uniform magnetization.

Unit-3

[15 Lectures]

Current Electricity and Bio electricity

Current Electricity: Steady current, current density \mathbf{J} , non-steady currents and continuity equation, Kirchoff's laws and analysis of multiloop circuits, growth and decay of current in LR and CR circuits, decay constants, LCR circuits. AC circuits, complex numbers and their

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DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class: B.Sc.

Max. Marks: 85 + (CCE) 15 = 100

applications in solving AC circuits problems, complex impedance and reactance, series and parallel resonance. Q-factor, power consumed by an A.C. circuit, power factor, Y and Δ networks and transmission of electric power.

Bioelectricity: Electricity observed in living systems, Origin of bioelectricity, Sodium and potassium transport, Resting potential and action potential, Nernst's equation, Conduction velocity, Origin of compound action potential, Neuron structure and function, An axon as cable, Membrane resistance and capacitance.

Unit-4

[15 Lectures]

Motion of Charged Particles in Electric and Magnetic Fields

(Note: The emphasis here should be on the mechanical aspects and not on the details of the apparatus mentioned which are indicated as applications of principles involved.)

E as an accelerating field, electron gun, discharge tube, linear accelerator. E as deflecting field - CRO, Sensitivity of CRO. Transverse B field; 180° deflection, Mass spectrograph and velocity selector, Curvatures of tracks for energy determination for nuclear particles; Principle and working of Cyclotron. Mutually perpendicular and parallel E & B fields; Positive ray parabolas, Discovery of isotopes, Elements of Mass Spectrographs, Principle of magnetic focusing (lenses).

Unit-5

[15 Lectures]

Electrodynamics

Electromagnetic induction, Faraday's Laws, Electromotive force, Integral and differential forms of Faraday's laws, Self and mutual inductance, Transformers, Energy in a static magnetic field, Maxwell's displacement current, Derivations of Maxwell's equations, Electromagnetic field energy density.

Poynting vector, Electromagnetic wave equation, Plane electromagnetic waves in vacuum and dielectric media, Reflection at a plane boundary of dielectrics, Fresnel's Laws, Polarization by reflection and total internal reflection, Waves in a conducting medium, Reflection and refraction by the ionosphere.

References:

1. Introduction to Electrodynamics: David J. Griffiths, 4th Edition, Printice Hall.
2. Classical Electrodynamics: Jhon David Jackson, Jhon Wiley & Sons.
3. Electrodynamics: Emi Cossor & Bassin Lorraine, Asahi Shimbunsha Publishing Ltd.
4. From Neuron to Brain: Kuffler and Nicholas, Sinauer Associates, Inc Pub. Sunderland, Masschuetts (Reference for topics of Bioelectricity)

DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class: B.Sc.

Max. Marks: 85 + (CCE) 15 = 100

Semester : IV (चतुर्थ)

Subject : Physics

Title of Paper : Electrostatics, Magnetostatics and Electrodynamics

इकाई-1

[15 Lectures]

स्थिरविद्युतिकी

निर्वात में कूलम्ब का नियम - सदिश रूप में, विद्युत क्षेत्र E की स्थिर आवेश के सरल द्विध्रुव व चतुर्ध्रुव आधूर्ण वितरण हेतु गणना। स्थिर विद्युत क्षेत्र में किसी आवेश पर किया गया कार्य एवं उसे रेखिक समाकलन रूप में लिखना, स्थिर विद्युत क्षेत्र की संरक्षी प्रकृति। विद्युत क्षेत्र और विभव में संबंध (E = -∇V), एक समान विद्युतीय क्षेत्र में द्विध्रुव का आधूर्ण व इसकी उर्जा। विद्युत क्षेत्र का फ्लक्स, गॉस का नियम व इसका सममित आवेश वितरण हेतु E के परिकलन में उपयोग। गॉसियन पीलबाक्स, चालक की सतह पर क्षेत्र, चालक द्वारा E क्षेत्र की स्क्रीनिंग।

संधारित्र, स्थिर विद्युत क्षेत्र उर्जा, किसी विद्युत क्षेत्र में रखे चालक की सतह के इकाई क्षेत्रफल पर उर्जा, समरूप विद्युत क्षेत्र में गोलकार चालक, किसी पृथ्वीकृत अनन्त चालक के सम्मुख बिन्दु पर आवेश। पराविद्युत, पराविद्युत की उपस्थिति में समानांतर प्लेट संधारित्र, परावैद्युतांक, ध्रुवण व ध्रुवण सदिश P, विस्थापन सदिश D, P एवं E में संबंध, क्लासियस-मौसाटी समीकरण की आणविक व्याख्या, दो समांगी माध्यमों की सतह पर E व D सदिश द्वारा सीमांत शर्तों का संतुष्टीकरण, उदाहरण द्वारा व्याख्या।

इकाई-2

[15 Lectures]

स्थिर चुम्बकत्व

किसी गतिमान आवेश पर बल, लारेंज बल समीकरण एवं B की परिभाषा, सीधे धारावाही चालक को चुम्बकीय क्षेत्र में रखने पर बल, धारा लूप पर बल आधूर्ण, चुम्बकीय बल आधूर्ण, कोणीय संवेग व जाइरोमैग्नेटिक अनुपात, बायोट-सेवार्ट का नियम, सरल ज्यामितीय परिस्थितियों में H की गणना (परनलिका एवं एंकर वलय), एम्पीयर का परिपथीय नियम, ∇×B = μ₀J व ∇·B = 0, चुम्बकीय द्विध्रुव द्वारा बद्ध व मुक्त धाराएँ, चुम्बकन सदिश (M); B, H एवं M में संबंध, असमरूप से चुम्बकित पदार्थ हेतु ∇×M = J का निगमन।

DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class: B.Sc.

Max. Marks: 85 + (CCE) 15 = 100

इकाई-3

[15 Lectures]

विद्युत धारा व. बायो-इलेक्ट्रीसिटी

स्थाई धारा, धारा घनत्व J , अस्थाई धारा समीकरण एवं सांतत्य समीकरण, किरचॉफ के नियम व मल्टीलूप परिपथ विश्लेषण, LR व CR परिपथ में धारा की वृद्धि व क्षय, क्षय-नियतांक, LCR परिपथ। AC परिपथ, समिश्र संख्याएं और उनके अनुप्रयोग द्वारा AC परिपथ में समिश्र प्रतिबाधा, रीएक्टेंस, श्रेणी एवं समानांतर अनुनाद को हल करना। Q गुणांक, AC परिपथ द्वारा शक्ति का उपयोग, शक्ति गुणांक, Y एवं Δ नेटवर्क व विद्युत शक्ति का प्रेषण।

जैव विद्युत: जैविक निकायों में विद्युत का अवलोकन, जैव विद्युत की उत्पत्ति, सोडियम और पोटेशियम परिवहन, स्थिर विभव एवं क्रियात्मक विभव, नर्नस्ट समीकरण, चालक वेग, यौगिक क्रिया विभव की उत्पत्ति, तंत्रिका कोशिका की रचना एवं कार्य, केबल के रूप में एक्सॉन, झिल्ली विभव एवं धारिता।

इकाई-4

[15 Lectures]

विद्युत व चुम्बकीय क्षेत्र में अविशित कणों की गति

(यहाँ उपकरणों के वर्णन की अपेक्षा उनके यांत्रिकीय पक्ष पर अधिक ध्यान दिया जाना चाहिए।)

त्वरण क्षेत्र के रूप में E, इलेक्ट्रान गन, विर्सजन नलिका, रेखीय त्वरक, E विक्षेपक क्षेत्र के रूप में CRO, CRO की सुग्राहिता। अनुप्रस्थ B क्षेत्र; 180° विचलन, द्रव्यमान स्पेक्ट्रोग्राफ या वेग सिलेक्टर, नाभिकीय कणों के संसूचन हेतु कणों के पथों की वक्रता, साइक्लोट्रॉन (उर्जा मापन) का सिद्धांत व कार्य पद्धति, समानान्तर व लम्बवत E व B क्षेत्र, धन-किरण के परवलय, आइसोटोप की खोज, द्रव्यमान स्पेक्ट्रोग्राफ के मूलतत्त्व, चुम्बकीय फोकस का सिद्धांत (लैंस)।

इकाई-5

[15 Lectures]

विद्युत गतिकी

विद्युत चुम्बकीय प्रेरण, फेराडे के नियम, विद्युत बाहक बल, फेराडे नियम के अवकलन व समाकलन रूप, स्व: व अन्योन्य प्रेरण, ट्रान्सफार्मर, स्थिर विद्युत क्षेत्र में उर्जा, मैक्सवेल की विस्थापन धारा घनत्व की संकल्पना, मैक्सवेल की समीकरणों की स्थापना, विद्युत चुम्बकीय क्षेत्र का उर्जा घनत्व।

पॉयंटिंग सदिश, विद्युत चुम्बकीय तरंग समीकरण, निर्वात एवं परावैद्युत माध्यम में सगतल विद्युत चुम्बकीय तरंग, परावैद्युत की समतल सतह से परावर्तन, फ्रेनेल के नियम, परावर्तन से ध्रुवण व पूर्ण आंतरिक परावर्तन, चालक माध्यम में तरंग, आयनमण्डल के द्वारा परावर्तन व अपवर्तन।

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DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Semester : IV
Subject : Physics

For Regular Students

Practical 25	Sessional 10	Viva 15	Total 50
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For Ex-Student

Practical 35	Sessional 00	Viva 15	Total 50
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List of Experiments:

1. Characteristics of a Ballistic galvanometer.
2. Setting up and using an electroscope or electrometer.
3. Measurement of low resistance by Carey-Foster bridge or otherwise.
4. Measurement of inductance using impedance at different frequencies.
5. Measurement of capacitance using, impedance at different frequencies.
6. Response curve for LCR circuits and response frequencies.
7. Sensitivity of a cathode-ray oscilloscope.
8. Use of a vibration magnetometer to study a field.
9. Study of Magnetic field due to current using Tangent Galvanometer.
10. Study of decay of currents in LR and RC circuits.
11. Study of Lissajous figures using CRO.

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DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class	B.Sc.	
Semester	IV	
Subject	(English)	Chemistry
	हिन्दी	रसायन शास्त्र
Paper	-	
Max. Marks	85 + CCE (सतत समग्र मूल्यांकन) 15	

Unit	Syllabus	Periods
UNIT I	<p>A. Phase equilibrium: statement and the meaning of terms: phase, component and the degree of freedom, thermodynamic derivation of the Gibbs phase rule, one component system: water, CO₂ and S system, two component system: solid-liquid equilibria, simple eutectic system: Bi-Cd; Pb-Ag system, Desilverisation of lead.</p> <p>B. Solid solution: Systems in which compound formation with congruent melting point (Zn-Mg) and incongruent melting point, (NaCl-H₂O) and (CuSO₄-H₂O) system, Freezing Mixtures: acetone-dry ice.</p> <p>C. Liquid- Liquid mixtures: Ideal liquid mixtures, Raoult's and Henry's law. Non-ideal system, azeotropes; HCl-H₂O and ethanol-water system.</p> <p>D. Partial miscible liquids: Phenol-water, trimethylamine - water and nicotine-water system. Lower and upper consolute temperature. Immiscible Liquids, steam distillation, Nernst distribution law: thermodynamic derivation, applications.</p>	18 Lectures
	<p>अ. प्रावस्था साम्य : कथन एवं विभिन्न पदों का अर्थ, प्रावस्था, घटक तथा स्वतंत्रता की कोटि, गिब्स प्रावस्था नियम का ऊष्मागतिक व्युत्पन्न, एक घटक तंत्र-जल तंत्र, CO₂ तंत्र एवं सल्फर तंत्र; दो घटक तंत्र-ठोस-द्रव साम्य, सरल गलन क्रांतिक तंत्र-बिस्मथ-कैडमियम तंत्र, सीसा-चौंदी तंत्र, सीसे का विरजतीकरण।</p> <p>ब. ठोस विलयन : तंत्र जिनमें सर्वांगसम गलनांक वाले यौगिक बनते हैं; (Zn-Mg), तथा जिसमें असर्वांगसम गलनांक वाले यौगिक बनते हैं (NaCl-H₂O) एवं (CuSO₄-H₂O) तंत्र हिम मिश्रण-एसिटोन-शुष्क बर्फ।</p> <p>स. द्रव-द्रव मिश्रण : आदर्श द्रव मिश्रण, राउल्ट एवं हेनरी का नियम, अनादर्श तंत्र, स्थिर वृथगांकी मिश्रण : HCl-H₂O तथा एथिल अल्कोहल-जल।</p> <p>द. आंशिक मिश्रणीय द्रव : फीनॉल-जल, ट्राइमेथिल ऐमीन-जल एवं निकोटिन-जल तंत्र, निम्न तथा उच्च संविलेय-संविलयन तापक्रम, अमिश्रणीय द्रव, भाप आसवन, नर्नस्ट का वितरण नियम : ऊष्मागतिक व्युत्पन्न, अनुप्रयोग।</p>	

	<p>Electrochemistry</p> <p>A. Electrical transport: conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, variation of specific conductance and equivalent conductance with dilution, Migration of ions and Kohlrausch-law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations, Debye-Huckel Onsager's equation for strong electrolytes (elementary treatment only). Transport number: Definition and determination by Hittorf method and moving boundary method.</p> <p>B. Types of reversible electrodes: Gas metal ion, metal-metal ion, metal-insoluble salt anion and redox electrodes. Electrode reactions, Nernst equation, derivation of cell EMF and single electrode potential, standard hydrogen electrode- reference electrodes-standard electrode, standard electrode potential. EMF of a cell and its measurements, computation of cell EMF, calculation of thermodynamic quantities of cell reaction (ΔG, ΔH, K). Solubility product and activity coefficient, potentiometric and conductometric titration.</p> <p>Definition of pH and pK, determination of pH using hydrogen, quinhydrone and glass electrodes by potentiometric methods.</p>	
<p>UNIT II</p>	<p>विद्युतीय रसायन :</p> <p>अ. विद्युतीय परिवहन : धातुओं और विद्युत अपघट्य के विलयनों में चालन, विशिष्ट चालकता तथा तुल्यांकी चालकता, विशिष्ट चालकता एवं तुल्यांकी चालकता पर तनुता का प्रभाव, आयनों का अभिगमन तथा कोलरॉश नियम, आरहीनियस का विद्युत अपघटनी वियोजन सिद्धांत एवं इसकी सीमाएं; प्रबल तथा दुर्बल विद्युत अपघट्य, ओस्टवाल्ड का तनुता नियम, उपयोग तथा इसकी सीमायें, प्रबल विद्युत अपघट्यों के लिए डिवाई - ह्यूकल-ऑसंगर समीकरण (केवल प्राथमिक परिचय), अभिगनांक; परिभाषा, हिटार्फ एवं गतिमान सीमा विधि द्वारा इसका निर्धारण।</p> <p>ब. उत्क्रमणीय इलेक्ट्रोड के प्रकार : गैस-धातु आयन, धातु-धातु आयन, धातु-अविलेय लवण ऐनायन तथा रेडॉक्स इलेक्ट्रोड: इलेक्ट्रोड अभिक्रिया, नर्नस्ट समीकरण; सेल के विद्युत वाहक बल का व्युत्पन्न, एकल इलेक्ट्रोड विभव; मानक हाइड्रोजन इलेक्ट्रोड, संदर्भ इलेक्ट्रोड, मानक इलेक्ट्रोड विभव। सेल का विद्युत वाहक बल एवं उसका मापन, सेल EMF का परिकलन; सेल अभिक्रियाओं के ऊष्मागतिकीय परिमाण की गणना (ΔG, ΔH, K). विलेयता गुणनफल एवं सक्रियता गुणांक, विभवमितीय एवं चालकतामितीय अनुमापन। pH तथा pK की परिभाषा, विभवमापी विधि द्वारा हाइड्रोजन इलेक्ट्रोड, क्विनहाइड्रोजन इलेक्ट्रोड एवं ग्लास इलेक्ट्रोड की सहायता से pH का निर्धारण।</p>	<p>18 Lectures</p>
	<p>A. Aldehydes and Ketones : Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes and ketones from acid chlorides, synthesis of aldehydes and ketones using 1,3 dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on Benzoin, Aldol Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction, Mannich reaction, use of acetals as</p>	

UNIT III	<p>protecting group. Oxidation of aldehydes, Baeyer-villiger oxidation of ketones, Cannizzaro reaction, Meerwein, Pinner, Verley, Clemmensen, Wolf Kishner, $LiAlH_4$ and $NaBH_4$ reduction.</p> <p>B. Carboxylic acids: Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic, reaction of carboxylic acids. Hell Volhard Zelinsky reaction. Synthesis of acid chlorides ester and amides reduction of carboxylic acids, mechanism of decarboxylation.</p>	18 Lectures
	<p>अ. ऐल्डिहाइड्स एवं कीटोन्स : नामकरण तथा कार्बोनिल समूह की संरचना, ऐल्डिहाइड्स एवं कीटोन्स बनाने की विधियाँ, ऐसिड क्लोराइड, 1, 3-डाइथायेन, नाइट्राइल एवं कार्बोक्सिलिक अम्ल के विशेष संदर्भ में, भौतिक गुण, कार्बोनिल समूह की नाभिकरनेही योगात्मक अभिक्रियाओं की क्रियाविधि-वेन्जाइन, ऐल्डोल संघनन, फर्किन एवं नोवेनजल संघनन की प्रमुखता देते हुए, ऐल्डिहाइड्स एवं कीटोन्स की अमोनिया एवं उसके व्युत्पन्नों के साथ संघनन क्रियाएँ, विटिग, मानिश अभिक्रिया, ऐसिटल का रक्षात्मक समूह के रूप में प्रयोग, ऐल्डिहाइड्स का ऑक्सीकरण, कीटोन्स का बेयर विलिगर ऑक्सीकरण, केनिजारो अभिक्रिया, मीरवीन-पोण्डॉक-वर्ल, क्लेमेन्सन, वुल्फ किशर अपचयन, $LiAlH_4$ एवं $NaBH_4$ अपचयन।</p> <p>ब. कार्बोक्सिलिक अम्ल : नामकरण, संरचना एवं आवंधन, भौतिक गुण, कार्बोक्सिलिक अम्लों की अम्लीयता, अम्ल की प्रबलता पर प्रतिस्थापियों का प्रभाव कार्बोक्सिलिक अम्लों का विरचन, रासायनिक अभिक्रियाएँ, हैल-वोल्हार्ड-जैलिन्सकी अभिक्रिया, ऐसिड क्लोराइडों, एस्टर एवं एमाइड का संश्लेषण, कार्बोक्सिलिक अम्लों का अपचयन, विकार्बोक्सिलीकरण की क्रियाविधि।</p>	
UNIT IV	<p>A. Carboxylic acids derivatives: structure and nomenclature of acid chlorides, esters amides and acid anhydrides. Physical properties, interconversion of acid derivative by nucleophilic acyl substitution, preparation of carboxylic acid derivatives, chemical reactions. Mechanism of esterification and hydrolysis (acidic and basic).</p> <p>B. Coordination Chemistry: MOT (molecular orbital theory) diagram for tetrahedral, square planar and octahedral complexes.</p> <p>C. Green Chemistry: Principles, 12 tenets, their description with examples.</p> <p>अ. कार्बोक्सिलिक अम्ल व्युत्पन्न : अम्ल क्लोराइड, एस्टर, एमाइड तथा अम्ल एनहाइड्राइड की संरचना तथा नामकरण, भौतिक गुण, अम्ल व्युत्पन्नों का नाभिकरनेही ऐसिल प्रतिस्थापन द्वारा अंतरपरिवर्तन; कार्बोक्सिलिक अम्ल व्युत्पन्न बनाने की विधियाँ, रासायनिक अभिक्रियाएँ, एस्टरिफिकेशन एवं जल अपघटन (अम्लीय तथा क्षारीय) की क्रियाविधि।</p> <p>ब. उपसहसंयोजन रसायन : आणविक कक्षक सिद्धांत, चतुष्फलकीय वर्गसमतलीय तथा अष्टफलकीय संकुलों के लिए आणविक कक्षक आरेख।</p> <p>स. हरित रसायन : परिचय, 12 अवधारणाएँ एवं उनका उदाहरण सहित वर्णन।</p>	18 Lectures
UNIT V	<p>A. Chemistry of Lanthanides: Electronic structure, oxidation states, ionic radii and lanthanide contraction, complex formation, occurrence and isolation of lanthanide compounds.</p> <p>B. Chemistry of Actinides: General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from U.</p>	18

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	Similarities between the later actinides and later lanthanides.	Lectures
	<p>अ. लैन्थेनाइड तत्वों का रसायन : इलेक्ट्रॉनिक संरचना, ऑक्सीकरण अवस्था, आयनिक त्रिज्या तथा लैन्थेनाइड संकुचन, संकुल निर्माण, लैन्थेनाइडों की प्राप्ति एवं पृथक्करण।</p> <p>ब. ऐक्टिनाइड तत्वों का रसायन : ऐक्टिनाइड के सामान्य गुण एवं रसायन, U से Np, Pu तथा Am के पृथक्करण का रसायन, पश्च ऐक्टिनाइड एवं पश्च लैन्थेनाइडों में समानताएँ।</p>	

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DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Recommended Books	<ol style="list-style-type: none">1. Physical Chemistry-Puri, Sharma and Pathania, Vikas Publications, New Delhi2. Physical Chemistry -G.M. Barrow, International Student Edition, McGraw Hill.3. The Elements of Physical Chemistry, P.W. Atkins, Oxford University Press4. Physical Chemistry, R.A. Alberty, Wiley Eastern Ltd.5. Physical Chemistry Through problems, S.K. Dogra and S. Dogra, Wiley Eastern6. Organic Chemistry, Morrison and Boyd, Prentice Hall.7. Organic Chemistry, L.G. Wade Jr. Prentice Hall8. Fundamentals of Organic Chemistry Solomons, John Wiley.9. Organic Chemistry, Vol. I, II, III S.M. Mukherji, S.P. Singh and R.P. Kapoor,10. Organic Chemistry, F.A. Carey, McGraw-Hill Inc.11. Introduction to Organic Chemistry, Streitwieser, 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 Wiley22. Inorganic Chemistry – Cotton and Wilkinson, John Wiley23. Inorganic Chemistry – Huheey, Harper Collins Pub. USA24. Inorganic Polymer – G.R. Chhatwal, Himalaya Pub.House25. 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।
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DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class / कक्षा	B. Sc.
Semester / सेमेस्टर	IV Semester
Subject / विषय	Botany
Title of Subject Group	PLANT ECOLOGY, BIODIVERSITY AND PHYTOGEOGRAPHY
अधिकतम अंक / अधिकतम अंक	अधिकतम अंक / अधिकतम अंक
Max. Marks / अधिकतम अंक	अधिकतम अंक / अधिकतम अंक

Particulars / विवरण

Unit-1	<p>Ecosystems: Structure and types, Biotic and Abiotic components, Trophic levels, Food chain, Food web, Ecological pyramids, Energy flow, Biogeochemical cycles: Concept, Gaseous and Sedimentary cycles, Carbon, Nitrogen, Phosphorus and Sulfur cycle.</p> <p>पारिस्थितिक तंत्र : संरचना एवं प्रकार, जैविक एवं अजैविक घटक, पोषी स्तर, खाद्यशृंखला खाद्यजाल, पारिस्थितिक पिरामिड, ऊर्जा प्रवाह, जैवभू रासायनिक चक्र : अकार्बनिक, नाइट्रोजन तथा अवसादीय चक्र, कार्बन, नाइट्रोजन फास्फोरस चक्र।</p>
Unit-2	<p>Ecological adaptations: Morphological, Anatomical and Physiological responses Water adaptation (Hydrophytes and Xerophytes Temperature adaptation (Thermoperiodism and Vernalization), Light adaptation (Heliophytes and Sciophytes), Plant Succession: causes, trends and processes, Types of succession - Hydrosere and Xerosere.</p> <p>पारिस्थितिक अनुकूलन : आकारिकी, आंतरिकी तथा कार्यिकी अनुकूलन, जल अनुकूलन (जलोदभिद तथा मरुदभिद), तापक्रम अनुकूलन (तापकालिता एवं उत्तरीकरण) प्रकाश अनुकूलन (प्रकाशरागी तथा छायारागी) पावन अनुक्रमण : कारण, प्रवृत्ति एवं प्रक्रिया, अनुक्रमण के प्रकार हाइड्रोसियर (जलीय अनुक्रमण), खरोसियर (स्थल अनुक्रमण)</p>
Unit-3	<p>Population Ecology: Distribution patterns, Density, Natality, Mortality, Growth curves, Ecotypes and Ecads: Community Ecology: Frequency, Density, Abundance: Cover and Life forms. Biodiversity: Basic concept, definition, Importance, Biodiversity of India, Hotspots, <i>in situ</i> and <i>ex situ</i> conservation, Biosphere reserves, Sanctuaries and National parks of Madhya Pradesh. Endangered and Threatened species, red data book.</p> <p>जनसंख्या पारिस्थितिकी : वितरण प्रणाली, घनत्व, जन्मदर, मृत्युदर, वृद्धिचक्र, इकोटाइप एवं इकोटाइडस, समुदाय पारिस्थितिकी : आवृत्ति, घनत्व, बहुलता, आच्छादन एवं जीवनरूप/जीवविकारिता - आधारभूत परिकल्पना, परिभाषा, महत्व, भारत की जीवविविधता, तत्परिस्थल स्वरूपाने तथा बाह्य स्थाने संरक्षण। जैव मण्डल संरक्षण, म.प्र. के अभयारण एवं राष्ट्रीय उद्यान, विलुप्तप्राय तथा खतरे में पड़ी प्रजातियाँ, रेड डाटाबुक।</p>
Unit-4	<p>Soil: Physico-chemical properties, Soil formation, Development of Soil Profile, Soil classification, Soil composition, Soil factors: Pollution: Definition, Types & Causes; Global warming, Climate change and Ozone hole.</p> <p>मृदा : भौतिक - रासायनिक गुण मृदा निर्माण, मृदा परिच्छेदिका का विकास मृदा कारक मृदा का स्तरीकरण, मृदा संतुलन प्रदूषण, परिभाषा, प्रकार एवं कारण, वैश्विक तापन, जलवायु परिवर्तन एवं ओजोन छिद्र।</p>

Unit-5 **Phytogeography:** Phytogeographical regions of India. Vegetation types of Madhya Pradesh. Natural resources – definition and classification. Conservation and management of natural resources. Land resources management, Water and Wet land resource management.

पादप भौगोलिकी : भारत के प्राचीन भौगोलिक क्षेत्र तथा नए जलवायु विभाग । प्राकृतिक स्रोत - प्राकृतिक स्रोतों की परिभाषा एवं वर्गीकरण, प्रबंधन एवं संरक्षण । भू-साधन प्रबंधन । जल संयंत्रों का प्रयोग ।

SUGGESTED READINGS:-

- Banerjee, S.1998. Bio diversity conservation- Agrobotamica. Bikaner.
- Kumar, U.K 2006. Bio diversity principles and conservation. Agrobios. Jodhpur.
- Odum, E.P. 5th ed. 2004 Fundamentals of Ecology. Natraj Publisher. Dehradun.
- Puri, G.S. 1960. Indian Forest Ecology.
- Sharma, P.D. 7th ed. 1998.Ecology and Environment, Rastogi Publication, Shivaji Road, Meerut, 250002. India.
- Shukla, R. S. & Chandel, P.S. 2006. A Text book of Plant Ecology.

Practical

Objectives :

- i) To enable the students to understand the plant in relation to environment.
- ii) To develop the knowledge of different types of vegetation.
- iii) To familiarize the students with conservation practices.

Practical Scheme
Semester- IV
Scheme of practical examination

Marks: 50

Time: 4 hrs

1-Exercise based on Ecology	10
2- Soil Test	5
3- Exercise based on Ecological adaptation	5
4-To comment upon Phytogeographic region (model/ charts) and National Parks(Photographs).	5
5-Spotting (1-5)	10
6-Viva- voce	5
7-Sessional	10
	Total: 50

DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class / कक्षा	:	B.Sc.
Semester / समेस्टर	:	IV
Subject / विषय	:	Zoology (प्राणीशास्त्र)
Title of Paper	:	Genetics
Maximum Marks	:	85

Unit I: Heredity & Variation, Gene and Genetic Material

1. Chromosome: The Physical basis of heredity and transmitters of heredity.
2. Types of chromosomes: Lampbrush, salivary gland and Beta Chromosomes.
3. Nucleocytoplasmic interactions : Ultra structure of nucleus, nucleolus, Role of nucleus and nucleolus in nucleocytoplasmic interactions including Synthesis & Export of RNA, transport of proteins
4. Heredity and Variation : Sources of variation, Genotype, phenotype and environmental variations (elementary idea)
 - Mendel's laws of heredity
 - Kinds of variations
 - Genetic basis of variation.
- 5 (a) Chemistry of Gene ; Nucleic Acids and their structure.
 - (b).Concept of DNA replication.
 - (c).Nucleosome (Solenoid model).
 - (d) Split genes, overlapping genes and Pseudo genes.
 - (e) Genetic Code.

Unit II: Linkage and Chromosomal Aberrations

1. Gene Linkage: Kinds and Theories of linkage, significance of linkage.
2. Crossing over: Types and mechanism.
3. Theories of sex determination.
4. Sex linked inheritance (Haemophilia, Colour blindness)

Unit III: Cytoplasmic Inheritance, Gene Expression and Regulation

1. Cytoplasmic inheritance: Maternal effect on limnea (Shell Coiling), Kappa particles in Paramecium.
2. Transcription in Prokaryotes and Eukaryotes
3. Translation in Eukaryotes
4. Gene Expression: Regulation of protein synthesis, transcription in Prokaryotes and Eukaryotes.
5. Gene Expression: Lac operon model

Unit IV: Mutation and Applied Genetics

1. Mutation

2. Structural and numerical changes in chromosomes.
3. Causes of mutation.
4. Mutagens- classification, Types & effects.

Unit V: Human Genetics & Genetic Engineering

1. Human chromosomes, Elementary idea of Human Genome Project
2. Common genetic diseases in man (Autosomal syndromes, sex chromosome syndromes, diseases due to mutation-Sickle cell anaemia, Albinism & Alkaptonuria.
3. Multiple factors and blood groups.
5. Techniques used in recombinant DNA technology. Construction of Chimeric DNA, Elementary idea of plasmids & vectors.
6. Gene cloning and Polymerase Chain Reaction (PCR), Gel Electrophoresis, Northern & Southern Blotting.
7. Gene therapy.
8. DNA finger printing.

DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Class / कक्षा	:	B.Sc.
Semester / सेमेस्टर	:	चतुर्थसत्र IV
Subject / विषय	:	Zoology (प्राणीशास्त्र)

Practical

1. Identification of spots related to theory.
2. Squash preparation of onion root tip /Chironomous larva salivary gland/grass hopper testis.
3. Study of instruments techniques related to applied genetics - PCR, Gel electrophoresis, DNA fingerprinting etc.
4. Problems based on genetics.
5. Study of chromosomal DNA (Isolation and demonstration)

Distribution of Marks

Time 3 hours

Maximum Marks: 50

Marks Allotted

1. Spotting (5 Spots)	10 Marks
2. Squash preparation	05 Marks
3. Study of instruments / techniques related to applied genetics	05 Marks
4. Problems on Genetics	10 Marks
5. Viva-Voce	05 Marks
6. Extraction of chromosomal DNA	05 Marks
7. Practical Record and Collection	10 Marks

Total 50 Marks

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DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

B.Sc./ B.A. IV Semester

Recommended by central Board of studies

Name of the Paper	Theory (M.M.)	Minimum Passing Marks in Theory	C.C.E. (M.M.)	Minimum Passing Marks in C.C.E.	Practical MM	Minimum Passing Marks	Total
Abstract Algebra, Advanced Calculus, Partial Differential Equations, Complex Analysis	125	42	25	8	---	---	150

Note: There will be three sections in the question paper. All questions from each section will be compulsory.

Section –A (20 marks.) will contain 10 objective type questions, two from each unit, with the weightage of 2 marks.

Section –B (35 marks.) will contain 5 short answer type questions (each having internal choice), one from each unit having 7 marks.

Section –C (70 marks.) will contain 5 long answer type questions (each having internal choice), one from each unit, having 14 marks.

There should be 12 teaching periods per week for Mathematics like other Science Subject

(6 Period Theory + 6 Period Practical)

DEVI AHILYA VISHWAVIDYALAYA, INDORE

B.Sc.B.Ed.

FOUR YEAR INTEGRATED COURSE

Max. Marks / अधिकतम अंक	:	125
Class/ कक्षा	:	B.Sc. /B.A.
Semester/ सेमेस्टर	:	IV
Subject / विषय	:	Mathematics
Title / शीर्षक	:	Abstract Algebra, Advanced Calculus, Partial Differential Equations, Complex Analysis

: Particulars/ विवरण :

Unit-1	Group automorphisms, inner automorphism, Group of automorphisms, Conjugacy relation and centraliser, Normaliser, Counting principle and the class equation of a finite group. Cauchy's theorem for finite abelian groups and non-abelian groups.
इकाई-1	समूह स्वकारिता (स्वसमरूपता), आंतर स्वकारिता, स्वकारिताओं का समूह, संयुग्मता संबंध एवं केन्द्रीयकारक, प्रसामान्यक, गणना सिद्धांत एवं परिमित समूह का वर्ग समीकरण। परिमित आबेले एवं अन-आबेले समूहों के लिये कौशी प्रमेय ।
Unit-2	Introduction to rings, subrings, integral domains and fields, simple properties and examples, ring homomorphism, ideals and quotient rings.
इकाई-2	वलय, उपवलय, पूर्णांकीय प्रांत एवं क्षेत्र का परिचय सरल गुणधर्म एवं उदाहरण, वलय समाकारिता, गुणजावली एवं विभाग वलय ।
Unit-3	Maxima, Minima and saddle points of functions of two variables, Improper integrals and their convergence, Comparison test, Abel's and Dirichlet's tests, Beta and Gamma

	functions.
इकाई-3	दो चरों के फलनों का उच्चतम, निम्नतम एवं सेडल बिन्दु, विषम समाकल एवं उनका अभिसरण, तुलना परीक्षण, आबेल एवं डिरीक्ले का परीक्षण, बीटा एवं गामा फलन।
Unit-4	Partial Differential equations of the first order, Lagrange's solution. Some special types of equations which can be solved easily by methods other than general methods, Charpit's general method of solution, Partial differential equations of second and higher orders, Homogeneous and non-Homogeneous equations with constant coefficients, Partial differential equations reducible to equations with constant coefficients.
इकाई-4	प्रथम कोटि के आंशिक अवकल समीकरण, लेग्रांजे का हल, कुछ विशिष्ट प्रकार के समीकरण जिन्हें व्यापक विधि के अलावा सरल विधि से हल किया जा सके, हल के लिए चारपिट की व्यापक विधि, द्वितीय एवं उच्चतर कोटि के आंशिक अवकल समीकरण, अचर गुणांकों के समघातीय एवं असमघातीय समीकरण, आंशिक अवकल समीकरण जो अचर गुणांकों वाले समीकरणों में परिवर्तनीय है।
Unit-5	Continuity and differentiability of Complex functions, Analytical function, Cauchy Riemann equation, Harmonic function, Mobius transformations, fixed points, cross ratio.
इकाई-5	सम्मिश्र फलनों का सांतत्य एवं अवकलनीयता। वैश्लेषिक फलन, कौशी रीमान समीकरण, प्रसंवादी फलन, मोबियस रूपांतरण, रिथर बिन्दु, तिर्यक अनुपात।

Text Books :

1. I.N. Sneddon, Elements of partial Differential equations Mc graw Hill, Co. 1988
2. Shanti Narayan, Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.
3. I.N. Herstein Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1977.
4. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum Publishing Co., New York
5. म.प्र हिन्दी ग्रंथ अकादमी की पुस्तकें ।

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Reference Books:

1. T.M. Apostol, Mathematical Analysis Narosa Publishing House, New Delhi 1985
2. N. Piskunov , Differential and Integral Calculus, Peace Publishers, Moscow.
3. S.C. Malik, Mathematical Analysis, Wiley Eastern Ltd., New Delhi.
4. N. Jacobson, Basis Algebra, Vols, I & II. W.H. Freeman, 1980 (also published by Hindustan Publishing Company.)
5. Shanti Narayan, A Text Book of Modern Abstract Algebra. S. Chand & Co. New Delhi
6. P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul, Basic Abstract Algebra, Wiley Eastern, New Delhi, 1997.
7. I. S. Luther and I.B. S. Passi, Algebra Vol- I , II, Narosa Publishing House.
8. R. V. Churchill & J.W. Brown, Complex Variables and Applications, 5th Edition, McGraw-Hili New. York. 1990
9. Mark; J. Ablowitz & A. S. Fokas. Complex Variables : Introduction and Applications, Cambridge University Press, South Asian Edition, 1998
10. Ponnuswamy : Complex Analysis, Narosa Publishing Co.

2 EPC II: DRAMA AND ART IN EDUCATION

Introduction

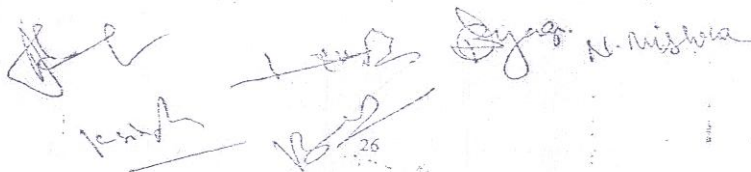
The need to integrate arts education in the formal schooling of our students is to retain our unique cultural identity in all its diversity and richness and encourage young students and creative minds to do the arts. An understanding of the arts will give our youth the ability to appreciate the richness and variety of artistic traditions as well as make them liberal, creative thinkers and good citizens of the Nation. Keeping in view some of these ideas, the National Curriculum Framework-2005, introduced arts education as a mainstream curricular area, which must be taught in every school as a compulsory subject (up to Class X) and facilities for the same may be provided in every school. Keeping this in view, it is all the more important that arts education is integrated in the school curriculum to provide an aesthetically viable atmosphere in schools encouraging creativity. For this, not only Art teachers but every teacher in the school system should be sensitized to understand and experience the use of Arts for holistic development of the learner, as a teacher as well as an individual.

OBJECTIVES

- Understanding basics of different Art forms – impact of Art forms on the human mind
- Enhance artistic and aesthetic sensibility among learners to enable them to respond to the beauty in different Art forms, through genuine exploration, experience and free expression
- Enhance skills for integrating different Art forms across school curriculum at secondary level • Enhance awareness of the rich cultural heritage, artists and artisans,

COURSE CONTENT UNIT 1: VISUAL ARTS AND CRAFTS (PRACTICAL)

- Experimentation with different materials of Visual Art, such as pastel, poster, pen and ink, rangoli materials, clay, etc.
- Exploration and experimentation with different methods of Visual Arts like Painting, block printing, collage, clay modelling, paper cutting and folding, etc.
- Paper framing and display of Art works.



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CC7: EDUCATIONAL TECHNOLOGY

OBJECTIVES:

1. To acquaint students with the nature and scope and Educational Technology (ET).
2. To develop competency in handling various Audio – Visual Aids and equipments.
3. To familiarize students with the role of mass media in improving teaching -learning process.
4. To develop in students the skill of preparing effective educational software.
5. To make students aware of the concept of System Approach in Education.

CONTENT:

Unit I: Educational Technology

- Concept ,meaning and definition
- Nature and Scope
- Hardware approaches
- Software approaches
- System approaches.

Unit II: Audio –Visual Aids

- Handling and application of different gadgets like OHP, Epidiascope, slide-cum-filmstrip projector, Film projector, Videotape Recorder, CCTV, Audio Tape Recorder.
- Preparation of AV aids:Charts, Models, Transparencies, Slides, Audiotapes, Video and Audio Scripting and Low Cost Teaching Aids.

Unit III: Mass Media: Role of mass media

- Radio, TV and Printed Material in teaching-learning process.

Unit IV: Individualized Instruction

- PLM: linear, Branch and Mathetics
- Instructional Strategies: Group, Individualised and Personalised
- Self Learning Material -Module ,Moodles,Digitalized Learning Material and OER ,
- Multimedia Approach: Meaning, Definition and steps of development.

Unit V: System Approach

- Meaning, components and Types of systems
- System Approach: Definition, Components with special reference to classroom instruction. Utility of system approach in the field of Education.

SUGGESTED ACTIVITIES:

- Preparation of AV aids: Charts/ models etc.

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- Development of multi media planner sheet.
- Preparation of PLM: linear, Branch and Methetics

REFERENCES:

- 📖 Brown, J.W., R.B. and Hercheroad: A.V. instruction Technology Media and Method. New York: McGraw Hill Books Company, 1977.
- 📖 Davis, I.K.: The management of Learning, London: McGraw Hill Book Company, 1971.
- 📖 Decca, John, P.: Educational Technology: Reading in Programmed Instruction, London: Holt Rinehart and Winston, 1964.
- 📖 Mangal, S.K.: Fundamentals of Educational Technology. Ludhiana: Prakash Brothers, 1988.
- 📖 Mukhopadhyay, M.: Educational Technology – Challenging Issue. New Delhi: Sterling Publishers Private Limited, 1980.
- 📖 Sampath, K. et.al: Introduction to Educational Technology. New Delhi: Sterling Publishers Private Limited, 1990.
- 📖 Sharma, R.A.: Technology of Teaching (Teacher Behaviour). Meerut: Loyal Book Depot, 1980.
- 📖 William, D. Bontwell: Using Mass Media in School. New York: Applet ion Century Crops. 1962.
- 📖 Taber, J.J., Glaser, R. and Schafer, H.H.: Learning and Programmed Instruction. Massachusetts: Addison Weller Reading. 1965.

R. P. Singh
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Workshop

Two workshops of half a day each, of one week duration for working with artists/artisans to learn basics of Arts and Crafts and understand its pedagogical significance. The Arts forms learnt during the course should be relevant to the studentteachers in their profession. Activities, such as drawing, and painting, rangoli, clay modelling, pottery, mixed collage, woodcraft, toy making, theatre, puppetry, dance, music, etc. region specific should be given more importance for making arts learnercentred. The focus of the workshops should be on how art forms can be used as tool/ method of teaching-learning of Languages, Social Sciences, Mathematics and Sciences

PRACTICAL PART

1. BODY MOVEMENT- Different theatre games, Exercises, Martial Arts, Folk Dances.
2. MEDITATION- Focus, Concentration.
3. SCRIPT WRITING- characterization, dialogue, time and space, beginning, middle, end.
4. POETRY RECITATION- Rigved Mantras, Vaachik Abhinay.
5. SELECTION OF PLAY FOR CHILDREN.
6. CASTING.
7. BUILDING OF A CHARACTER.
8. PARTS OF SPEECH- Volume, Pitch, Speed, clarity, Audibility, Diction, Intonation, Feel and Toner Quality, Projection.
9. DESIGN OF A PRODUCTION.
10. PRODUCTION- Poster Making, Audience, Execution of Different Aspects of Production, Analysis of Increase in Understanding of Children through Drama.

Suggested Approach for Teaching-learning Process

Every student-teacher must participate and practice different Art forms. They need to be encouraged to visit places of arts/scce performances/ exhibitions/art and craft fairs/local craft bazaars, etc. Artists and artisans may be invited for demonstrations and interactions from the community. Student-teachers should be encouraged to maintain their diary on art interactions to enhance their knowledge and awareness in this area. Student-teachers can also be motivated to interpret art works/ commercials/events etc. to enhance their aesthetics sensibility.

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A Resource Centre for Arts and Crafts should be a part of all the RIEs, where materials, including books, CDs, audio and video cassettes, films, software, props, art works of Regional and National level, books and journals must be displayed for the purpose of reference and continuous motivation.

Application of Arts and Aesthetics in day-to-day life, in the institute and in the community are some of the practical aspects, which needs to be taken care too. Studentteachers must organise and participate in the celebrations of festivals, functions, special days, etc.

Modes of Assessment

The complete course is of 50 marks. It is recommended that evaluation of this course should be done at both the levels; (i) Internal as well as (ii) External. Practical Activities (Units 1 and 2 of 30 marks) in nature are more on the process than the product, hence need continuous and comprehensive evaluation (CCE). Therefore, recommended to be evaluated by the internals. The theory and project part (Unit 3 and Project work of 20 marks) can be in viva-voce and in presentation mode therefore recommended to be evaluated by the externals. The engagement of student-teacher in the above set of experiences should be evaluated on continuous and comprehensive manner, based on (a) submission of work/project; (b) participation in the activities; (c) creative potential displayed; (d) application of aesthetic sensibility in campus events and in other course activities.

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N. Nishida

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