TRR GOVERNMENT DEGREE COLLEGE
KANDUKUR, PRAKASAM (DT) AP

TEACHING PLAN (SYNOPSIS)

ACADEMIC YEAR-2021-22

Name of the Lecturer: Dr.N. Tirupathi Swamy

Department: Botany

Commissionerate of Collegiate Education, A.P.,

TRR Government Degree College, Kandukur, Prakasam Dt.

Proforma for Teaching Plan

me of the Department/Subject	:	Botany
me of the Lecturer	:	Dr.N.Tirupathi Swamy
urse/Group	:	BSC/BZC
per	:	SEM I(Paper – I) Fundamentals of Microbes& Non-Vascular plants
me of the Topic	:	Origin of life and Viruses Five Kingdom classification
urs required	:	02
arning Objectives	:	1. Students understand the microscopic organisms 2 Will differentiate Bacteria and Viruses 3. will appreciate the advantages of the Microbes
evious knowledge to be reminded:		

1. Origin of life, concept of primary Abiogenesis: Miller and Urey experiment. Five kingdom classification of R.H. Whittaker.
2. Discovery of microorganisms, Pasteur experiments germ theory of diseases.
3. Shape and symmetry of viruses: structure of TMV and Gemini virus: multiplications of TMV: A brief account of Prions and Viroids.

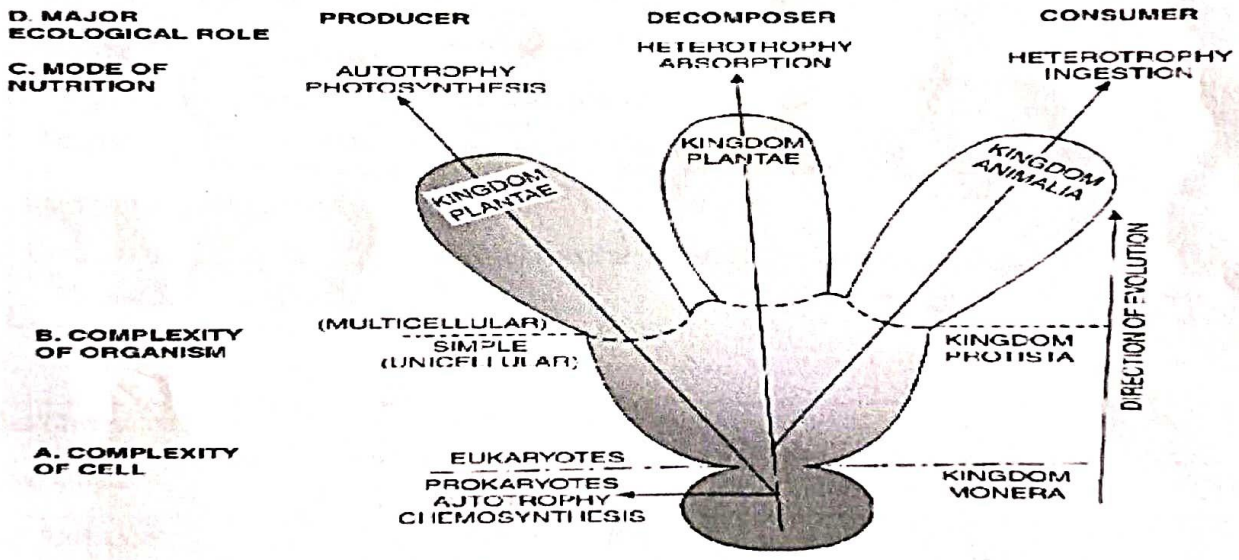

Fig: The Five Kingdoms Of Life

amples/Illustrations	Algae, Bacteria, fungus, Virus
ldditional inputs	Information on Harmful microbes
aching Aids used	Google images, PPts
ferences cited	B.P. Pandey, Dubey RC, Pelczar and CCEText Book
ident Activity planned after the teaching	Students observe the slides of microorganism
tivity planned outside the Class room, if any	Practice diagrams
y other activity	Visit Laboratory

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Proforma for Teaching Plan

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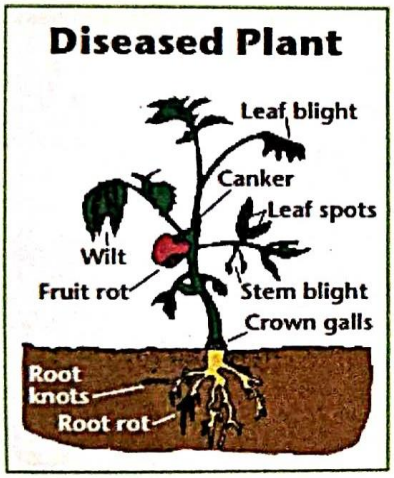
me of the Lecturer	:	Dr Tirupathiv Swamy
urse/Group	:	BSC/BZC
per	:	SEM I(Paper – I) Fundamentals of Microbes& Non-Vascular plants
me of the Topic	:	Origin of life and Viruses Plant Diseases and Bio pesticides
urs required	:	01
arning Objectives	:	1.The students are able to understand crop yield depends on Healthy crop 2.The students distinguish the Pesticides and Bio pesticides
evious knowledge to be reminded:		Disease symptoms

1. A general account on symptoms of plant diseases caused by Viruses. Transmission of plant viruses and their control.
2. Significance of viruses in vaccine production, bio-pesticides and as cloning vectors.



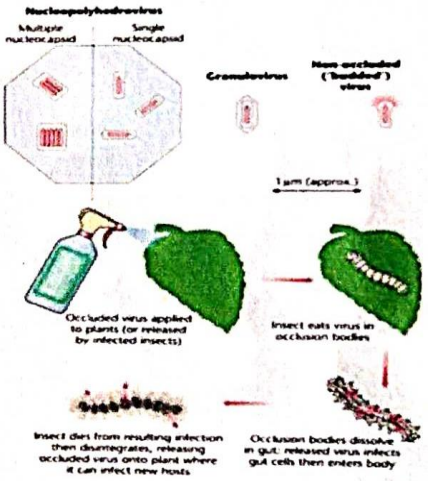
Viral biopesticides

- **Baculoviruses**

Nuclear Polyhedrosis Virus — Granulosis Virus

- Nucleic acid-single molecule of circular super coiled DNA
- Virion structurally complex with 10 -25 polypeptides 4-11 associated with nucleocapsid
- Replication in host cell nuclei

- **Cytoplasm Polyhedrosis Virus**



amples/Illustrations	Plant diseases
ldditional inputs	Pesticides
aching Aids used	Google images, PPts
ferences cited	B.P. Pandey, Dubey RC, Pelczar and CCE Text Book
ident Activity planned after the ching	Practice diagrams
tivity planned outside the Class room, ny	Observation of crops if any diseases
y other activity	Field visit

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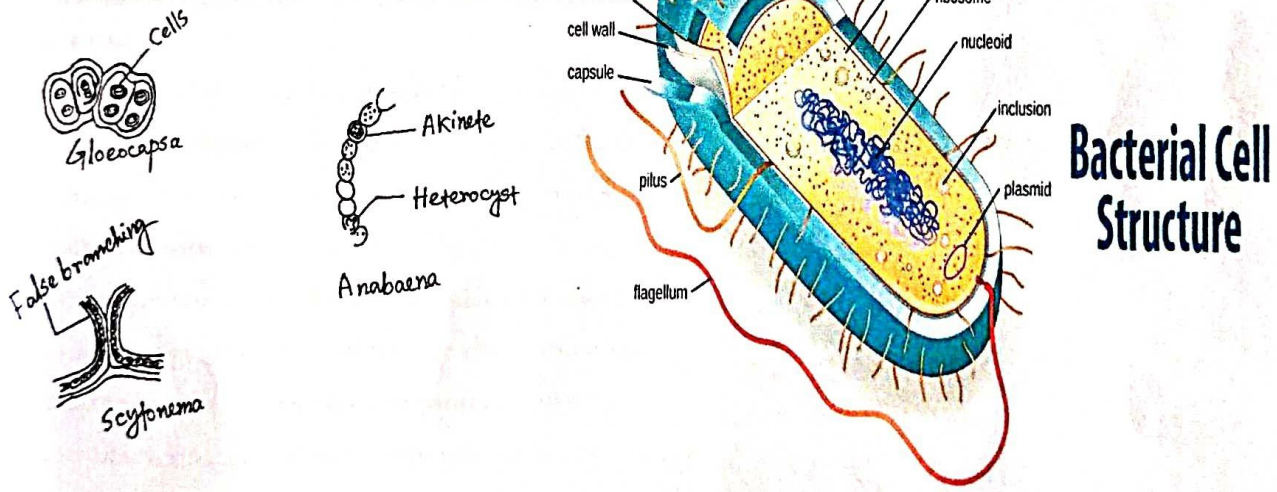
Proforma for Teaching Plan

me of the Department/Subject	:	Botany
me of the Lecturer	:	Dr N.Tirupathi Swamy
urse/Group	:	BSC/BZC
ber	:	SEM I (Paper – I) Fundamentals of Mycrobes & Non-Vascular plants
me of the Topic	:	Special groups of Bacteria and Eubacteria Bacterial Cell
urs required	:	01
arning Objectives	:	1.Students will understand the structure of Bacterial cell 2.Students are able to differentiate the Eukaryotic and prokaryotic cell
evious knowledge to be reminded:		Cell structure and function

1. Brief account of Archaebacteria, Actinomycetes and Cyanobacteria
2. Cell structure and nutrition of Eubacteria
3. Reproduction – Asexual (Binary fission and endospores) and bacterial recombination (Conjugation, Transformation, Transduction)



amples/Illustrations	Archaebacteria and Cyanobacteria
ditional inputs	Culture of milk fish in pens
aching Aids used	Google images, PPts
ferences cited	B.P. Pandey, Dubey RC, Pelczar and CCE Text Book
ident Activity planned after the ching	Practice diagrams
tivity planned outside the Class room, ny	Observation of sewage
y other activity	Study the Bacterial slides

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Proforma for Teaching Plan

me of the Department/Subject	:	Botany
me of the Lecturer	:	Dr Tirupathi Swamy
urse/Group	:	BSC/BZC
per	:	SEM I (Paper – I) Fundamentals of Mycrobes & Non-Vascular plants
me of the Topic	:	Citrus Canker
urs required	:	01
arning Objectives	:	1.Students understand the Citrus canker disease 2.Students predict consequences of diseases
evious knowledge to be reminded:		Citrus species

1. Economic importance of Bacteria with reference to their role in Agriculture and industry (fermentation and medicine.
2. A general account on symptoms of plant diseases caused by Bacteria: Citrus canker.

CITRUS CANKER

Symptoms

- Lesions are surrounded by a **yellow halo.**
- Spotting in petiole cause **premature defoliation.**
- Symptoms more prominent on young plant parts.
- Spots are also developed on fruits.
- Canker on fruits are similar to those on leaves.
- Sometimes yellow halo absent in the fruit canker.
- Only fruit rind is affected, the pulp not affected.
- The black spots reduce the market value of the fruits

ww.easybiologyclass.com

amples/Illustrations	Bacterial diseases
ditional inputs	Pathogen types
aching Aids used	Google images, PPts
ferences cited	B.P. Pandey, Dubey RC, Pelczar and CCE Text Book
dent Activity planned after the teaching	Google images, PPts
tivity planned outside the Class room, if any	Seminar
y other activity	Visit crops for identification of plant diseases

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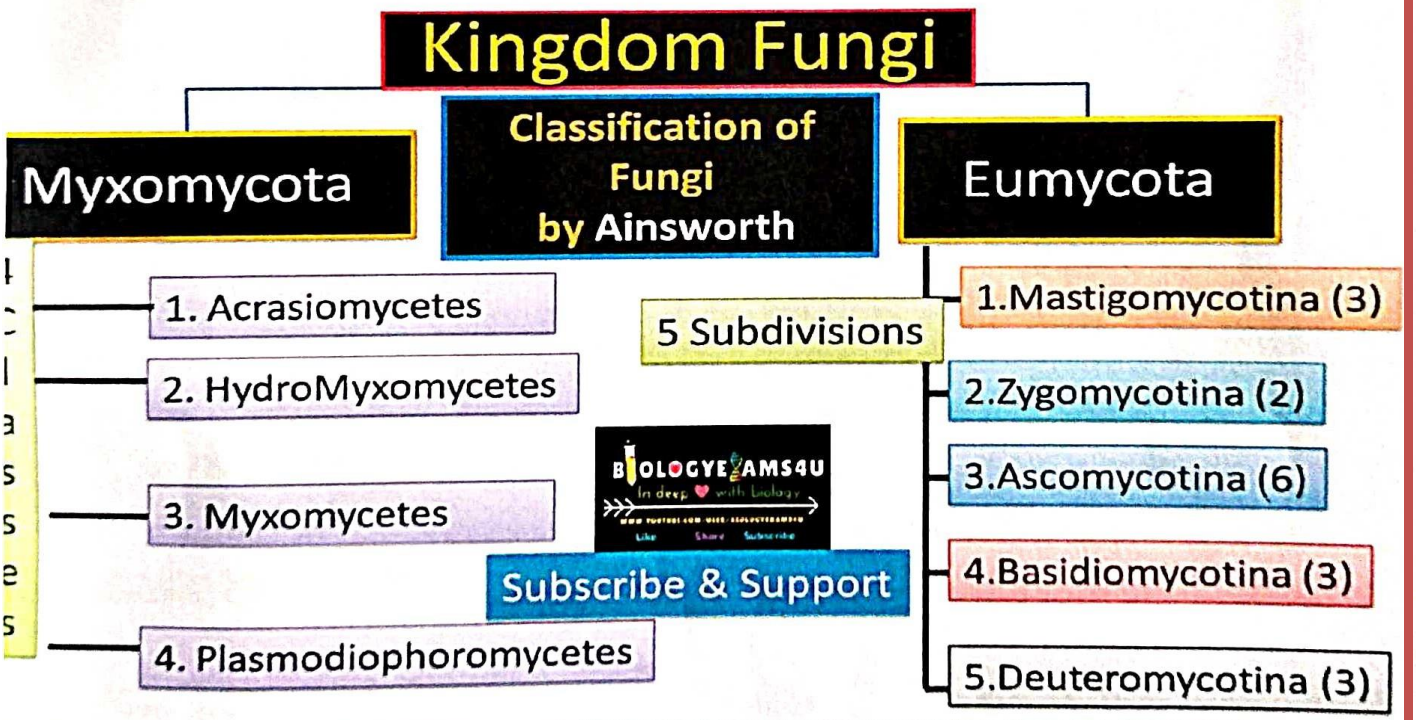
Performa for Teaching Plan

me of the Department/Subject	:	Botany
me of the Lecturer	:	Dr.N.Tirupathi Swamy
urse/Group	:	BSC/BZC
per	:	SEM I (Paper – I) Fundamentals of Mycrobes & Non-Vascular plants
me of the Topic	:	Fungi and Lichens Classification of Fungi
urs required	:	01
arning Objectives	:	1.Students are able to understand the fungal varieities 2.Students are distinguish the different classification of fungi
vious knowledge to be reminded:		

1. General characteristics of fungi and Ainsworth classification (upto classes)
2. Structure, reproduction and life history of (a) Rhizopus (Zygomycota) and (b) Puccinia (Basidiomycota)
3. Economic uses of fungi in food industry, pharmacy and agriculture.



amples/Illustrations	Fungal types
ditional inputs	Fungal fruitbodies
aching Aids used	Google Images, PPts
ferences cited	B.P. Pandey, Dubey RC, Pelczar and CCE Text Book
dent Activity planned after the teaching	Assignment
tivity planned outside the Class room, if any	Identification of fungi
y other activity	Visit Bakeries

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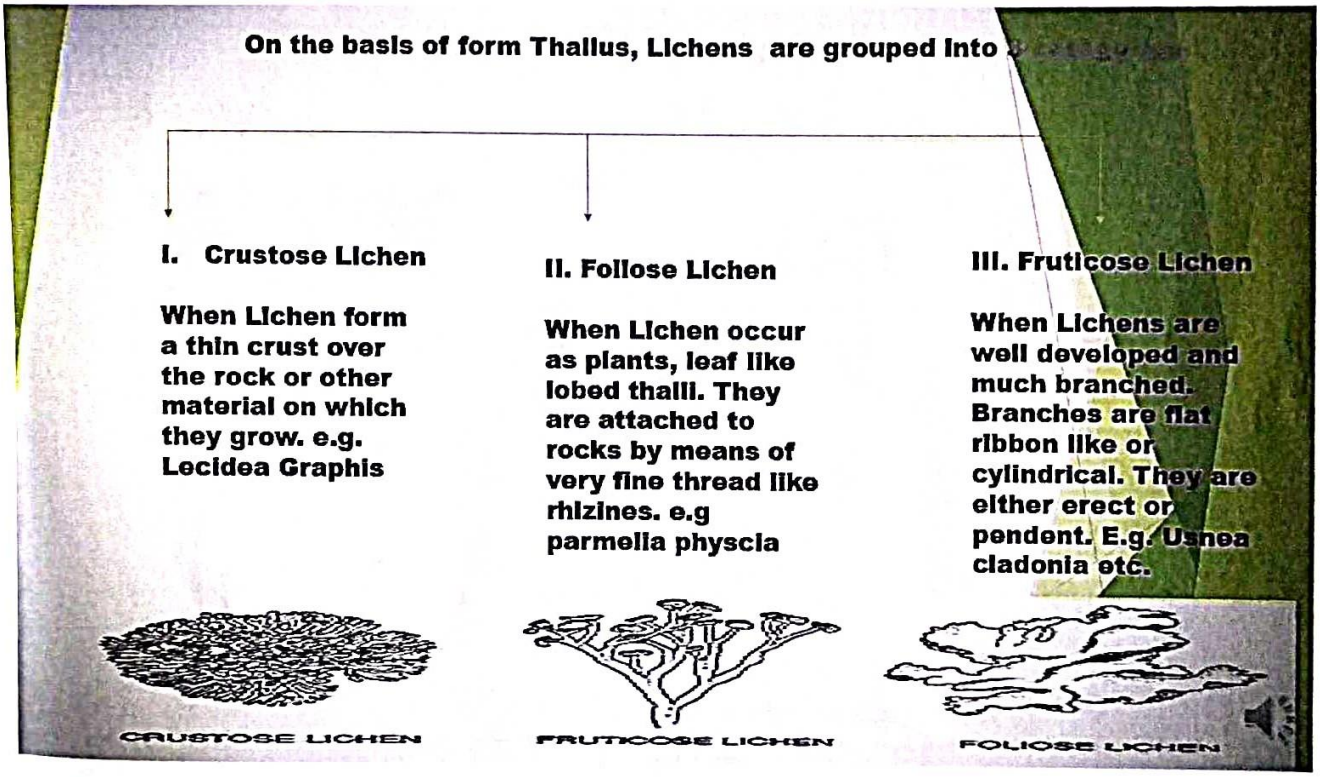
Performa for Teaching Plan

me of the Department/Subject	:	Botany
me of the Lecturer	:	Dr Tirupathi Swamy
urse/Group	:	BSC/BZC
per	:	SEM I(Paper – I) Fundamentals of Mycrobes & Non-Vascular plants
me of the Topic	:	Fungi and Lichens Types of Lichens
urs required	:	01
arning Objectives	:	1.Students will understand the Structure of Lichens 2.Students find out the combination of two species in Lichen
evious knowledge to be reminded :		

1. Lichens – structure and reproduction: ecological and economic importance.



amples/Illustrations	Lichens importance
ditional inputs	Habitation of Lichens
aching Aids used	Google images, PPts
ferences cited	B.P. Pandey, Dubey RC, Pelczar and CCE Text Book
dent Activity planned after the teaching	Practice diagrams
tivity planned outside the Class room, if any	Observation of Models in Laboratory
y other activity	Visit fields and forests

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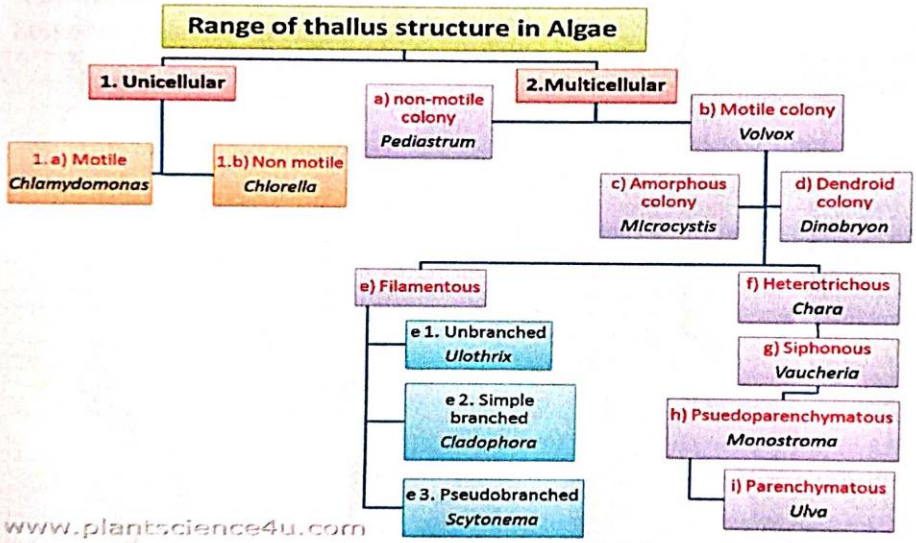
me of the Department/Subject	:	Botany
me of the Lecturer	:	Dr Tirupathi Swamy
urse/Group	:	BSC/BZC
per	:	SEM I(Paper – I) Fundamentals of Microbes& Non-Vascular plants
me of the Topic	:	Algae
urs required	:	01
arning Objectives	:	1.Students understand the Thallus organization of Alage 2.Students learn the importance of producers in Pond Ecosystem
evious knowledge to be reminded:		Aquatic species

1. General characteristics of Algae (pigments, flagella and reserve food material) Fritsch classification (upto classes)
2. Thallus organization and life cycles in Algae.



amples/Illustrations	Photosynthetic species in water
ldditional inputs	Algal types
aching Aids used	Google images, PPts
ferences cited	B.P. Pandey, Dubey RC, Pelczar and CCE Text Book
udent Activity planned after the teaching	Assignment
tivity planned outside the Class room, if any	Collect pond water for knowing Thallus organization of Algae
y other activity	Visit Canals

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Performa for Teaching Plan

ne of the Department/Subject	:	Botany
ne of the Lecturer	:	Dr N.Tirupathi Swamy
ırse/Group	:	BSC/BZC
ıer	:	SEM I (Paper – I) Fundamentals of Mycrobes & Non-Vascular plants
ne of the Topic	:	Algae-Economic importance
urs required	:	02
arning Objectives	:	1.Students are able to know the nutrional value of Algae 2.Students predict the value of Algae in Industry 3.Students learn the fodder value of Algae
evious knowledge to be reminded	:	Nutrition

1. Occurrence, structure, reproduction and life cycle of (a) Spirogyra (Chlorophyceae) and (b) Polysiphonia (Rhodophyceae).
2. Economic importance of Algae.

Table 2.3: Economic importance of Algae

Name of the Algae	Economic importance
Beneficial activities	
hlorella, Laminaria, Sargassum, Ulva, nteromorpha	Food
racilaria, Gelidiella, Gigartina	Agar Agar – Cell wall material used for media preparation in the microbiology lab. Packing canned food, cosmetic, textile paper industry
hondrus crispus	Carrageenan – Preparation of tooth paste, paint, blood coagulant
aminaria, Ascophyllum	Alginate – ice cream, paints, flame proof fabrics
aminaria, Sargassum, Ascophyllum, Fucus	Fodder
iatom (Siliceous frustules)	Diatomaceous earth– water filters, insulation material, reinforcing agent in concrete and rubber.
ithophyllum, Chara, Fucus	Fertilizer
hlorella	Chlorellin -Antibiotic
hlorella, Scenedesmus, hlamydomonas	Sewage treatment, Pollution indicators
Harmful activity	
ephaleuros virescens	Red rust of coffee

amples/Illustrations	Fresh water Algae and Marine Algae
ditional inputs	Spirulina
aching Aids used	Google images, PPts
erences cited	B.P. Pandey, Dubey RC, Pelczar and CCE Text Book
dent Activity planned after the teaching	Assignment
tivity planned outside the Class room, if any	Study the different algae
y other activity	Visit local available ponds

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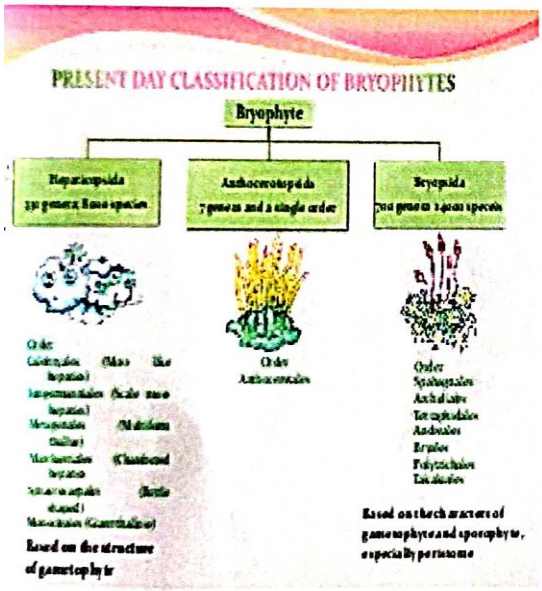
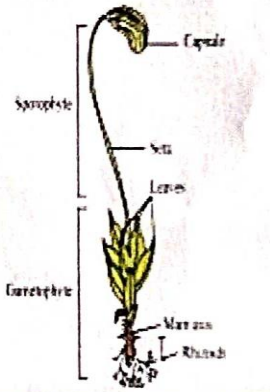
urse/Group	:	BSC/BZC
per	:	SEM I(Paper – I) Fundamentals of Mycrobes & Non-Vascular plants
me of the Topic	:	Bryophytes Funaria
urs required	:	02
arning Objectives	:	1. Students differentiate the Habitat of Algae and Bryophytes 2.Students understand the structure of Funaria
evious knowledge to be reminded:		Bryophytes General characters

1. General characteristics of Bryophytes: classification upto classes.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of (a) Marchantia (Hepaticopsida) and (b) Funaria (Bryopsida).



- Moss plant Funaria grows in dense patches or cushions in moist shady and cool places during the rainy seasons.
- It has a height of 3–5 cm, a radial symmetry with a differentiation of an axis or stem, leaves or phylloids and multicellular colorless branched rhizoids
- These are primitive multicellular, autotrophic, shade loving, amphibious plants.
- They reproduce by spore formation.
- They have no vascular system.
- Root like structures called rhizoids are present.
- They show alternation of generation i.e. the gametophytic stage alternates with the sporophytic stage



amples/Illustrations	Bryophytes species
ditional inputs	Marchantia structure
aching Aids used	Google images, PPts
ferences cited	B.P. Pandey, Dubey RC, Pelczar and CCE Text Book
dent Activity planned after the teaching	Practice diagrams
tivity planned outside the Class room, if any	Habitations of Bryophytes
y other activity	Visit Wet Lands

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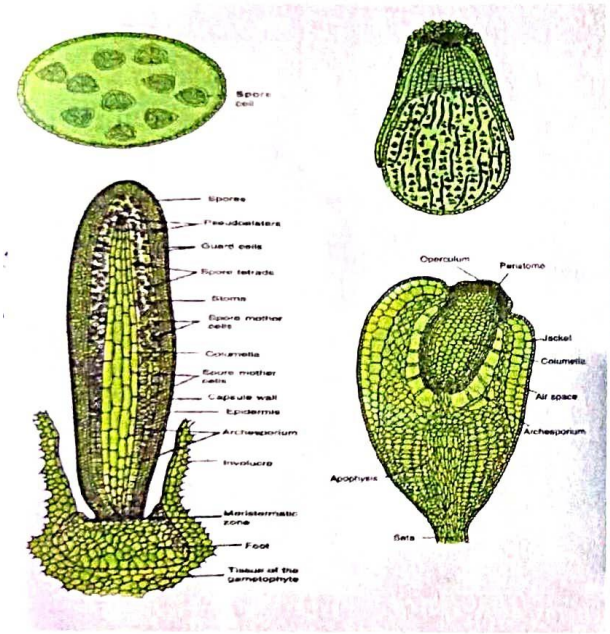
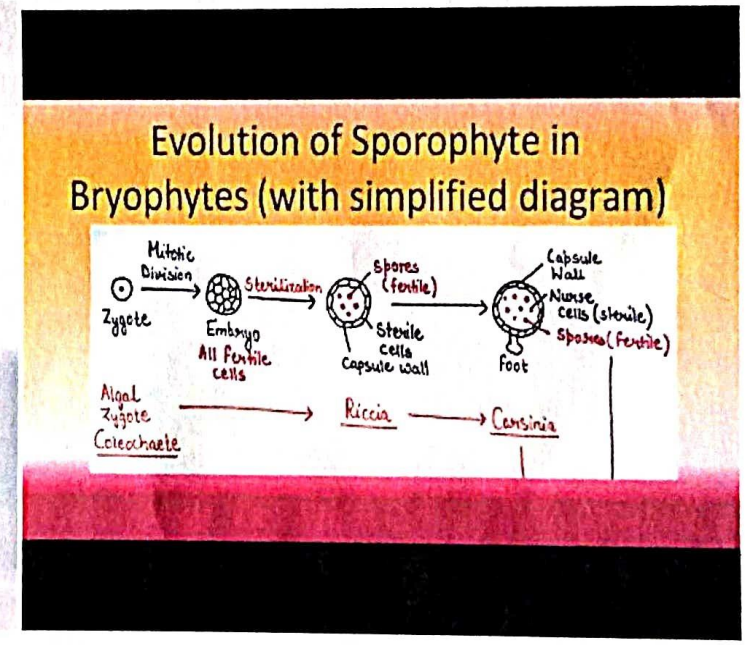
per	:	SEM I(Paper – I) Fundamentals of Microbes& Non-Vascular plants
me of the Topic	:	Bryophytes Evolution of Sporophyte
urs required	:	02
arning Objectives	:	1. Students learn the evolution trends in Sporophyte 2.Students analyze the sporophytes of Bryophytes
revious knowledge to be reminded:		Reproduction of Bryophytes

1. General account on evolution of sporophytes in Bryophyta.





amples/Illustrations	Riccia and Anthoceros
ditional inputs	Sporulation in Sporophytes
aching Aids used	Google images, PPts
ferences cited	B.P. Pandey, Dubey RC, Pelczar and CCE Text Book
dent Activity planned after the teaching	Practice diagrams
vity planned outside the Class room, if any	Seminar
other activity	Visit water bodies

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June-2019

ANNEXURE -3

MODEL TEACHING PLAN (SYNOPSIS)

Course : B.Sc I (MPC & MPCS) Subject : Mathematics Paper : I

Topic : Differential Equations of first order and first degree

Hours Required : 09

Learning Objectives * : Solving the given Differential Equation

Previous knowledge to be reminded : Formulae of Integration

Topic Synopsis :

Differential Equations – Introduction

Linear differential equations in 'y'

Linear differential equations in 'x'

Bernoulli's equations

Exact differential equations

(Continue on the reverse side if needed)

Thrust areas : Bernoulli's equations

Skills to be learnt by students : To solve the given differential equation

Examples / Illustrations * : problems

Additional inputs * : Examples

Teaching Models used * : —

Teaching Aids used * : Smart Board

References cited * : S.Chand publications by V.Venkateswara Rao

Student Activity Planned * after the teaching : Interaction

Activity Planned outside * class : —

Any other : classes starts from 15.06.2019

Signature of the lecturer

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July-2019

ANNEXURE -3

MODEL TEACHING PLAN (SYNOPSIS)

Course : B.Sc (MPC & MPCs) I Subject : Mathematics Paper : I

Topic	: Orthogonal Trajectories & Homogeneous linear DE's
Hours Required	: 16
Learning Objectives *	: Solving the given differential equation
Previous knowledge to be reminded	: Formation of differential equation
Topic Synopsis	: Integrating Factors Change of variables Orthogonal Trajectories – Cartesian Coordinates Orthogonal Trajectories – Polar Coordinates Equations Solvable for P, x, y & clairaut's Eq's Solution of Homogeneous linear DE's

(Continue on the reverse side if needed)

Thrust areas	self orthogonal family of curves
Skills to be learnt by students	To solve the given differential equation problems
Examples / Illustrations *	Examples
Additional inputs *	—
Teaching Models used *	Smart Board
Teaching Aids used *	S.Chand publications by V.Venkateswara Rao
References cited *	Interaction
Student Activity Planned * after the teaching	Assignment
Activity Planned outside * class	—
Any other	

Signature of the lecturer

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ANNEXURE -3

August-2019

MODEL TEACHING PLAN (SYNOPSIS)

Course : I B.Sc (MPC & MPCS) **Subject :** Mathematics **Paper :** I

Topic : Solution of Non-Homogeneous linear D.E's

Hours Required : 15

Learning Objectives * : Finding the general Solution of the given D.E

Previous knowledge to be reminded : Solution of Homogeneous linear D.E's

Topic Synopsis :

P.I of $f(D)y = Q$ when $Q = e^{ax}$

P.I of $f(D)y = Q$ when $Q = \sin ax$ or $\cos ax$

P.I of $f(D)y = Q$ when $Q = x^k$

P.I of $f(D)y = Q$ when $Q = e^{ax}V$

P.I of $f(D)y = Q$ when $Q = xV$

(Continue on the reverse side if needed)

Thrust areas : P.I of $f(D)y = Q$ when $Q = xV$

Skills to be learnt by students : To find the general solution of the given equation

Examples / Illustrations * : problems

Additional inputs * : Examples

Teaching Models used * : —

Teaching Aids used * : Smart Board

References cited * : S.Chand publications by V.VenkateswaraRao

Student Activity Planned * after the teaching : Interaction

Activity Planned outside * class : Quiz

Any other : MID Examinations Conducted

Signature of the lecturer

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ANNEXURE -3

MODEL TEACHING PLAN (SYNOPSIS)

September – 2019

Course : B.Sc (MPC & MPCS) I Subject : Mathematics Paper : I

Topic	: Solution of linear D.E's with non constant coefficients
Hours Required	: 15
Learning Objectives *	: Solving the given differential equation
Previous knowledge to be reminded	: Solution of Homogeneous linear D.E's
Topic Synopsis	: Change of the dependent variable, when a part of the C.F is known. Method of Variation of Parameters Cauchy-Euler Equations

(Continue on the reverse side if needed)

Thrust areas	Method of variation of Parameters
Skills to be learnt by students	To Solve the given differential equation problems
Examples / Illustrations *	Examples
Additional inputs *	—
Teaching Models used *	Smart Board
Teaching Aids used *	
References cited *	S.Chand publications by V.Venkateswara Rao
Student Activity Planned * after the teaching	Interaction
Activity Planned outside * class	Group Discussion
Any other	ANU practical Examinations From 30.09.2019 To 04.10.2019

Signature of the lecturer
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June-2019

ANNEXURE -3

MODEL TEACHING PLAN (SYNOPSIS)

Course : B.Sc (MPC & MPCs) III Subject : Mathematics Paper : V

Topic	:	Vector Differentiation
Hours Required	:	09
Learning Objectives *	:	Derivatives of Vectors
Previous knowledge to be reminded	:	Formulae of Differentiation
Topic Synopsis	:	Vector Differentiation Derivatives of Vectors Differentiability Directional derivatives Partial Differentiation Differential operators – Gradient

(Continue on the reverse side if needed)

Thrust areas	Directional Derivatives
Skills to be learnt by students	Differentiate the given function
Examples / Illustrations *	problems
Additional inputs *	Examples
Teaching Models used *	–
Teaching Aids used *	Smart Board
References cited *	S.chand publications by V.Venkateswara Rao
Student Activity Planned * after the teaching	Interaction
Activity Planned outside * class	–
Any other	classes starts from 10.06.2019

Signature of the lecturer

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July-2019

ANNEXURE -3

MODEL TEACHING PLAN (SYNOPSIS)

Course : B.Sc (MPC & MPCs) III Subject : Mathematics Paper : V

Topic : Differential Operators & Vector Integration

Hours Required : 13

Learning Objectives * : Evaluating the different types of integrals

Previous knowledge to be reminded : properties of vectors

Topic Synopsis : Divergence of a vector

Solenoidal vector, Laplacian operator

Curl of a vector

Irrotational vector

Vector Integration – Line, Surface and Volume Integrals

(Continue on the reverse side if needed)

Thrust areas : Laplacian operator

Skills to be learnt by students : To evaluate different types of integrals

Examples / Illustrations * : problems

Additional inputs * : Examples

Teaching Models used * : –

Teaching Aids used * : Smart Board

References cited * : S. Chand publications by V. Venkateswara Rao

Student Activity Planned * after the teaching : Interaction

Activity Planned outside * class : Assignment

Any other : –

Signature of the lecturer

Ch. Suresh Kumar
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ANNEXURE -3

August-2019

MODEL TEACHING PLAN (SYNOPSIS)

Course : B.Sc (MPC & MPCs) III Subject : Mathematics Paper : V

Topic : Vector Integration Applications & Rings

Hours Required : 11

Learning Objectives * : Applications of Vector Integration

Previous knowledge to be reminded : Line, Surface and Volume Integrals

Topic Synopsis :

Green's theorem

Gauss's Divergence theorem

Stokes theorem

Introduction of Rings

Boolean Rings

(Continue on the reverse side if needed)

Thrust areas	Gauss's Divergence theorem
Skills to be learnt by students	To apply the concerned theorem
Examples / Illustrations *	problems
Additional inputs *	Examples
Teaching Models used *	—
Teaching Aids used *	Smart Board
References cited *	S.Chand publications by V.Venkateswara Rao
Student Activity Planned * after the teaching	Interaction
Activity Planned outside * class	Quiz
Any other	MID Examinations Conducted

Signature of the lecturer

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ANNEXURE -3

MODEL TEACHING PLAN (SYNOPSIS)

September – 2019

Course : B.Sc (MPC & MPCS) III **Subject :** Mathematics **Paper :** V

Topic : Sub Rings, Ideals & Homomorphism, Isomorphism of Rings

Hours Required : 10

Learning Objectives * : properties of Rings

Previous knowledge to be reminded : properties of Groups

Topic Synopsis :

Integral Domains
Division Rings
Fields
Characteristic of a ring
SubRings, Ideals
Homomorphism & Isomorphism of Rings
Prime Ideals, Maximal Ideals

(Continue on the reverse side if needed)

Thrust areas : Characteristic of a ring

Skills to be learnt by students : properties of Rings

Examples / Illustrations * : problems

Additional inputs * : Examples

Teaching Models used * : –

Teaching Aids used * : Smart Board

References cited * : S.chand publications by V.VenkateswaraRao

Student Activity Planned * after the teaching : Interaction

Activity Planned outside * class : Group Discussion

Any other : ANU practical Examinations From 30.09.2019 TO 04.10.2019

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TRR GOVERNMENT DEGREE COLLEGE, KANDUKUR

TEACHING SYNOPSIS

2020 - 2021

SUBJECT: PHYSICS

PAPER V: MECHANICS, WAVES AND OSCILLATIONS

NAME OF THE TEACHER: DR. P.S.NAIDU

Commissionerate of Collegiate Education, A.P.,

TRR Government Degree College, Kandukur, Prakasam Dt.

Proforma for Teaching Plan

Name of the Department/Subject	:	Physics
Name of the Lecturer	:	Dr. P.S.Naidu
Course/Group	:	III M.P.C.
Paper	:	V-ELECTRICITY,MAGNETISM AND ELECTRONICS
Name of the Topic	:	Dielectrics
Hours required	:	6
Learning Objectives	:	D,E and P relation
Previous knowledge to be reminded	:	Capacitors, Polarization

Uses of dielectrics: 1.To increase the capacitance of the condensers dielectric materials like paper, Mica etc are placed in between the plates.

2. For insulation on electric conductors, dielectrics are used in form of layers around the conductors.

3. Dielectrics are also used for mechanical support to H.T. wires.

4. To increase the dielectric strength in electric fields dielectric materials are used.

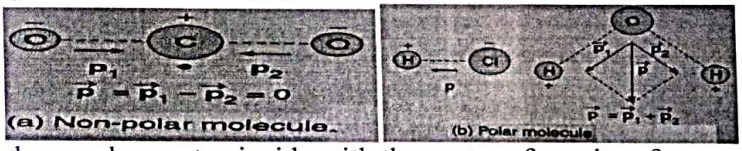
Atomic view of dielectrics

The atoms or molecules consist of positive charges as well as negative charges in equal magnitude. The positive charges have one centre of gravity and negative charges have one centre of gravity.Dielectrics are of two types. 1) Non-polar dielectrics 2) Polar dielectrics

1) Non-polar dielectrics :- If the centre of gravity of positive charges coincides with the centre of gravity of negative charges, those molecules are called non-polar dielectrics.

Ex:- H_2, N_2, O_2, CO_2 etc.

2) Polar dielectrics :- If the centre of gravity of positive



charges does not coincide with the centre of gravity of negative charges, those molecules are called polar dielectrics.Ex:- H_2O, HCl, CO, N_2O etc.

Electric field intensity (E) :- The electric field intensity at a point in an electric field is equal to the electrostatic force acting on unit positive charge placed at that point.

Dielectric polarization (P) :- The dielectric polarization is the dipole moment per unit volume of the dielectric(or) It is the induced surface charge density ($P = q_1/A$).

Electric displacement (D) :- Electric displacement is an electric vector whose surface integral over a closed surface is equal to the free charge with in the closed surface (or) It is the free surface charge density ($D = q/A$)Consider a parallel plate capacitor with out dielectric. Let the charges on thetwo plates are +q and -q. The electric field between the plates is E_o.

D, E & P are vectors.

So, we can write this relation as $\boxed{\bar{D} = (\epsilon_o \bar{E} + \bar{P})}$

Examples/Illustrations	Capacitors
Additional inputs	Gauss law applications
Teaching Aids used	Black board, Teaching Material
References cited	Unified Books, Telugu Academy Books, others
Student Activity planned after the teaching	Preparation of Teaching Material
Activity planned outside the Class room, if any	Solving Related Problems
Any other activity	Preparation of Competitive Exam Bits based on this Lesson

P. Sainadu

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Proforma for Teaching Plan

Name of the Department/Subject	:	Physics
Name of the Lecturer	:	Dr. P.S.Naidu
Course/Group	:	III M.P.C.
Paper	:	V-ELECTRICITY,MAGNETISM AND ELECTRONICS
Name of the Topic	:	Electric and Magnetic fields
Hours required	:	6
Learning Objectives	:	Biot savart law, applications and Hall effect
Previous knowledge to be reminded	:	Magnetic flux, Steady currents

Topic Synopsis: According to Ampere's law, the line integral of magnetic field B along a closed curve is equal to μ_0 times the net current i through the area bounded by the curve, i.e., $\boxed{\int B.dl = \mu_0 i}$; where μ_0 is the permeability of free space (or air).

According to Oersted's experiment, a current carrying conductor produces a magnetic field around it. In 1820, Biot and Savart performed a series of experiments to study the magnetic field produced by various current carrying onductors. They obtained a relation by means of which B can be calculated at any point of space around a condctor in which a current is passing. The relation is called as Biot and Savart law.

Combining all these factors: $dB \propto \frac{i\,dl\sin\theta}{r^2}$

In vector form, $\boxed{dB = \frac{\mu_0}{4\pi}\cdot\frac{i\,dl\times\hat{r}}{r^3}}$ i.e., $B = \int dB$

Consider an infinitely long conductor placed in vacuum and carrying a current I ampere as shown in fig. The aim is to derive an expression for magnetic induction B due to the conductor at a point P on X-axis using Biot and Savart law

$$B = \frac{\mu_0 i}{4\pi R}\left[\sin\left(\frac{\pi}{2}\right) - \sin\left(-\frac{\pi}{2}\right)\right] = \frac{\mu_0 i}{4\pi R}[1-(-1)] = \frac{\mu_0 i}{4\pi R}\cdot 2 = \frac{\mu_0 i}{2\pi R} \quad or \quad \boxed{B = \frac{\mu_0 i}{2\pi R}}\frac{weber}{meter^2}\ or\ tesla$$

consider a circular coil of radius a and carrying a current i. P is a point on the axis of the coil distant x from the centre. We are required to calculate the field at point P. Consider a small element AB of length dl.

If there are N turns in the coil, then $\boxed{B = \frac{N\mu_0 i a^2}{2(a^2+x^2)^{\frac{3}{2}}}}\frac{weber}{meter^2}$ or $tesla$

The direction of B is along the axis of the coil.

(i) At the centre of the coil $x = 0$. Thus, at the centre of the coil $B = \frac{N\mu_0 i a^2}{2a^3} = \frac{N\mu_0 i}{2a}$ or $\boxed{B = \frac{N\mu_0 i}{2a}}$

(ii) At very far off from the loop $x \gg a$ and $(a^2+x^2)^{\frac{3}{2}} \approx x^3$; $\boxed{B = \frac{N\mu_0 i a^2}{2x^3}}$

Hall effect: Hall effect was discovered by E.H. Hall in 1879. **According to Hall effect, when a magnetic field is applied perpendicular to a current carrying conductor, a potential difference is developed between the points on opposite side of the conductor.** This effect gives information about the sign of charged carriers in electric conductor.

So $R_H = \frac{E_H}{j\,B} = \frac{1}{n\,q}$ or $\boxed{R_H = \frac{1}{n\,q}}$

Examples/Illustrations	Semiconductors, stewart gees apparatus
Additional inputs	Problems
Teaching Aids used	Black board, Teaching Material
References cited	Unified Books, Telugu Academy Books, others
Student Activity planned after the teaching	Preparation of Teaching Material
Activity planned outside the Class room, if any	Solving Related Problems
Any other activity	Preparation of Competitive Exam Bits based on this Lesson

P. Gundu

Signature of the Lecturer

Commissionerate of Collegiate Education, A.P.,	
TRR Government Degree College, Kandukur, Prakasam Dt.	
Proforma for Teaching Plan	
Name of the Department/Subject :	Physics
Name of the Lecturer :	Dr. P.S.Naidu
Course/Group :	III M.P.C.
Paper :	V-ELECTRICITY,MAGNETISM AND ELECTRONICS
Name of the Topic :	Electromagnetic Induction
Hours required :	6
Learning Objectives :	Faradays laws, Self induction and Mutual induction
Previous knowledge to be reminded :	Ampere law, Magnetism

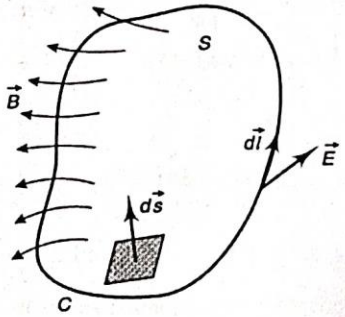
The two laws of electromagnetic induction.

(1) Whenever the magnetic flux linked with a circuit is changed, an e.m.f., is induced in the circuit.

(2) The magnitude of induced e.mf. is directly proportional to the negative rate of variation of magnetic flux linked with the circuit. If φ_B be the magnetic flux linked with circuit at any instant and e be the induced e.m.f., then $\boxed{e = -\frac{d\varphi_B}{dt}}$; This law is also known as Neumann's law.

If there are N turns in the coil, then $\boxed{e = -N\frac{d\varphi_B}{dt}}$

It follows that $\nabla \times E = -\frac{dB}{dt}$ *or* $\boxed{curl\, E = -\frac{dB}{dt}}$; This is the differential form of Faraday's law.



Coefficient of Self Induction

The total magnetic flux φ_B linked with the coil is proportional to the current i, flowing in it, i.e.,

$\varphi_B \propto i$ *or* $\varphi_B = L\,i$ where L is a constant called the coefficient of self induction or self inductance of the coil

$W = L\int_0^{i_0} i\,di = L\left[\frac{i^2}{2}\right]_0^{i_0} = \frac{L}{2}[i_0^2 - 0] = \frac{1}{2}L\,i_0^2$ *or* $\boxed{W = \frac{1}{2}L\,i_0^2}$

This is stored as energy of magnetic field.

The self inductance of the solenoid is therefore, $L\,i = Total\ flux\ linked\ with\ the\ solenoid = \mu_0\, n^2\, i\, A\, l$ $\boxed{L = \mu_0\, n^2\, A\, l}$ where n is number of turns per unit length.

In terms of total number of turns N of the solenoid $L = \mu_0 \left(\frac{N}{l}\right)^2 A\, l$ *or* $\boxed{L = \frac{\mu_0 N^2 A}{l}}$

Mutual inductance:When a current is passed in the primary coil P there is a change of magnetic flux linked with it, and an induced e.m.f. is set in the secondary coil S. This phenomenon is called mutual inductance.

Thus, $\varphi_B \propto i$ *or* $\boxed{\varphi_B = M\,i}$

the total flux linked with the secondary is $M\,i = n_2\,\mu_0 \frac{n_1}{l}\,i\,a$ $\boxed{M = \frac{n_1\, n_2\, \mu_0\, a}{l}}$

Examples/Illustrations	Transformer
Additional inputs	Problems
Teaching Aids used	Black board, Teaching Material
References cited	Unified Books, Telugu Academy Books, others
Student Activity planned after the teaching	Preparation of Teaching Material
Activity planned outside the Class room, if any	Solving Related Problems
Any other activity	Preparation of Competitive Exam Bits based on this Lesson

Signature of the Lecturer

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Proforma for Teaching Plan

Name of the Department/Subject	:	Physics
Name of the Lecturer	:	Dr. P.S.Naidu
Course/Group	:	III M.P.C.
Paper	:	V-ELECTRICITY,MAGNETISM AND ELECTRONICS
Name of the Topic	:	Alternating currents
Hours required	:	6
Learning Objectives	:	Alternating current parameters, LR, CR, LCRCirciuts
Previous knowledge to be reminded	:	Direct Current, wave equation

Topic Synopsis: An alternating current or a.c. is defined as one which passes through a cycle of changes at regular intervals. The waveform of such a voltage or current is shown in fig. and is mathematically represented by $i = i_0 \sin\omega t$ or $E = E_0 \sin\omega t$Here I or E represents the instantaneous value whereas the peak or maximum value is represented by i_0 or E_0. The term ωt is called the phase. The time of one cycle is known as time period represented by T and the number of cycles per second gives the frequency of supply $= \frac{1}{T}$.

Average Value of A.C. During Complete Cycle the average value of a.c. over one complete cycle is zero. Similarly, we can prove for alternating e.m.f.

Mean or Average Value of A.C. Current for Half Cycle $i_{av} = -\frac{2\,i_0}{\omega\,T}[\cos\pi - \cos 0] = -\frac{2\,i_0}{\omega\,T}[-1-1] = -\frac{2\,i_0}{\omega\,T}\cdot -2 = \frac{4\,i_0}{\left(\frac{2\pi}{T}\right)T} = \frac{2\,i_0}{\pi}$ or $\boxed{i_{av} = \frac{2\,i_0}{\pi}}$ **R.M.S. Value of Current** $\overline{i^2} = \frac{{i_0}^2}{2\,T}\left[T - \frac{1}{2\omega}[\sin 4\pi - \sin 0]\right] = \frac{{i_0}^2}{2\,T}\left[T - \frac{1}{2\omega}[0]\right] = \frac{{i_0}^2}{2\,T}\cdot T = \frac{{i_0}^2}{2}$ or $\overline{i^2} = \frac{{i_0}^2}{2} = {i_{rms}}^2$ or $\boxed{i_{rms} = \frac{i_0}{\sqrt{2}}}$

Form Factor It is defined as the ratio of rms value to the average value i.e., $Form\ factor = \frac{i_{rms}}{i_{av}} = \frac{V_{rms}}{V_{av}}$ Now, we know that $i_{rms} = \frac{i_0}{\sqrt{2}}$ and $i_{av} = \frac{2\,i_0}{\pi}$ $Form\ factor = \frac{i_{rms}}{i_{av}} = \frac{\frac{i_0}{\sqrt{2}}}{\frac{2\,i_0}{\pi}} = \frac{i_0}{\sqrt{2}}\cdot\frac{\pi}{2\,i_0} = 1.11$

L R circuit: circuit containing non-inductive resistance R and an inductance L in series connected to a source of alternating e.m.f. ($E = E_0 \sin\omega t$) The amplitude of current $i_0 = \frac{E_0}{\sqrt{(L^2\,\omega^2 + R^2)}}$ (ii) The current lags in phase behind the e.m.f. by an angle given by $\varphi = \tan^{-1}\left(\frac{L\,\omega}{R}\right) = \tan^{-1}\left(\frac{X_L}{R}\right)$; where X_L is the inductive reactance of the circuit.(iii) The impedance Z of the circuit $Z = \frac{E_0}{i_0} = \sqrt{(L^2\,\omega^2 + R^2)} = \sqrt{({X_L}^2 + R^2)}$

C R circuit: (i) The amplitude of current $i_0 = \frac{E_0}{\sqrt{\left(\frac{1}{C^2\omega^2} + R^2\right)}}$ (ii) The current lags in phase behind the e.m.f. by an angle given by $\varphi = \tan^{-1}\left(\frac{1}{\omega\,C\,R}\right) = \tan^{-1}\left(\frac{X_C}{R}\right)$; where X_C is the inductive reactance of the circuit.(iii) The impedance Z of the circuit $Z = \frac{E_0}{i_0} = \sqrt{\left(\frac{1}{C^2\omega^2} + R^2\right)} = \sqrt{({X_C}^2 + R^2)}$

Examples/Illustrations	LR, CR and LCR Circuits
Additional inputs	Problems
Teaching Aids used	Black board, Teaching Material
References cited	Unified Books, Telugu Academy Books, others
Student Activity planned after the teaching	Preparation of Teaching Material
Activity planned outside the Class room, if any	Solving Related Problems
Any other activity	Preparation of Competitive Exam Bits based on this Lesson

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Proforma for Teaching Plan

Name of the Department/Subject	:	Physics
Name of the Lecturer	:	Dr. P.S.Naidu
Course/Group	:	III M.P.C.
Paper	:	V-ELECTRICITY,MAGNETISM AND ELECTRONICS
Name of the Topic	:	Maxwell's Equations
Hours required	:	6
Learning Objectives	:	Derivationof Maxwell's Equations
Previous knowledge to be reminded	:	Basic laws in electrostatics

Topic Synopsis: Maxwell in 1862 formulated the basic laws of electricity and magnetism in the form of four fundamental equations. These equations are known as Maxwell's equations. The integral forms of these equations are given below.

$\iint E \cdot dS = \frac{q}{\varepsilon_0}$ .....(1); $\iint B.dS = 0$.....(2); $\int E.dl = -\frac{d\varphi_B}{dt}$.....(3); $\int B.dl = \mu_0\left(J + \varepsilon_0 \frac{\partial E}{\partial t}\right)$.....(4)

Maxwell's equations can also be stated in the differential forms as follows:

$divE = \frac{\rho}{\varepsilon_0}$.....(5); $div\ B = 0$.....(6); $curl\ E = -\frac{\partial B}{\partial t}$ .....(7); $curl\ B = \mu_0 J$..... (8)

Maxwell's Wave Equation or Equation of Electromagnetic Waves

$divE = \nabla \cdot E$ =.....(1); $div\ B = \nabla \cdot B = 0$....(2); $curl\ E = \nabla \times E = -\frac{\partial B}{\partial t}$ .....(3); $curl\ B = \nabla \times B = \mu\varepsilon \frac{\partial E}{\partial t}$..... (

Substituting the value of $\nabla \times \nabla \times B$ from eq. (6) in eq. (5), we get $\boxed{\nabla^2 B = -\mu\varepsilon \frac{\partial^2 B}{\partial t^2}}$

Substituting the value of $\nabla \times \nabla \times E$ from eq. (8) in eq. (9), we get $\boxed{\nabla^2 E = -\mu\varepsilon \frac{\partial^2 E}{\partial t^2}}$

Wave Velocity

The general wave equation is represented by $\nabla^2 y = -\mu\varepsilon \frac{\partial^2 y}{\partial t^2}$

where v is the velocity of wave and y is its amplitude. Comparing eqs. (10) and (11) we can say that the factor $\mu\varepsilon$ has the same significance as $\left(\frac{1}{V^2}\right)$. So we find that the variations of Eand Bare propagated in homogeneous, isotropic medium with a velocity given by $\frac{1}{V^2} = \mu\varepsilon$ or $V^2 = \frac{1}{\mu\varepsilon}$ or $\boxed{V = \frac{1}{\sqrt{\mu\varepsilon}}}$; where μ and ε are permeability and permittivity of the medium.

Hertz Experiment: Maxwell predicted the propagation of electromagnetic waves from theoretical considerations. Hertz demonstrated these waves experimentally. When the D.C. voltage supplied by induction coil becomes sufficiently high, the air gap between C and D gets ionized. As a result, the gap becomes conducting. Now the electrical discharge takes place between the two plates A and B. The oscillatory discharge through conducting air produces a train of electromagnetic waves.

Examples/Illustrations	Waves
Additional inputs	Problems
Teaching Aids used	Black board, Teaching Material
References cited	Unified Books, Telugu Academy Books, others
Student Activity planned after the teaching	Preparation of Teaching Material
Activity planned outside the Class room, if any	Solving Related Problems
Any other activity	Preparation of Competitive Exam Bits based on this Lesson

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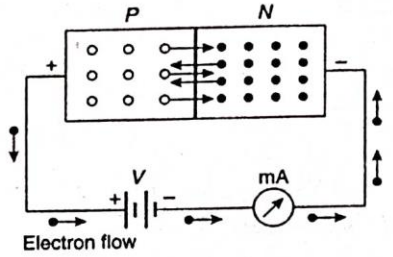
Proforma for Teaching Plan

Name of the Department/Subject	:	Physics
Name of the Lecturer	:	Dr. P.S.Naidu
Course/Group	:	III M.P.C.
Paper	:	V-ELECTRICITY,MAGNETISM AND ELECTRONICS
Name of the Topic	:	Basic Electronics
Hours required	:	12
Learning Objectives	:	PN diode, Zener diode, Transistor
Previous knowledge to be reminded	:	Materials classification , semiconductors

Topic Synopsis:

This is a two terminal device consisting of a P-N junction formed either rwith Ge or Si crystal. When a P-type material is intimately joined to N-type, a P-N junction is formed. The plane dividing the two zones is known as a junction.



Working of Diode: In order to consider the working of a diode, we shall consider the effect of forward bias and reverse bias across the P-N junction.**(1) Forward bias:** When an external voltage is applied to P-N junction in such a direction that it cancels the potential barrier and permits the current flow is called as forward bias. **(2) Reverse Bias:** When an external voltage is applied to P-N junction in such a direction that it increases the potential barrier then it is called as reverse bias.

Zener diode: is a reversed biased heavily-doped silicon (or germanium) P-N junction diode which is operated in the breakdown region. Due to higher temperature and current capability, silicon is preferred in comparison to germanium.

Transistor: The term transistor is the short form of the combination of two words, transfer and resistor. In case of transistor, the current is transferred from low resistance circuit to high resistance circuit. This is also called "Bipolar Junction Transistor (or) BJT" because both majority and minority charge carriers i

The transistor has three regions. They are 1) Emitter 2) Base and 3) Collector

1) **Emitter** :- This is one end of the of the transistor. Its space is moderate and is doped heavily. It supplies charge carriers and injects in to bas

2) **Base** :- This is the middle part of the transistor. Its space is narrow and is lightly doped. It allows most of the charge carriers into collector region which were injected into base.

3) **Collector** :- This is the other end of the transistor. Its space is large and is moderately doped. It collects the charge carriers from the base.

Relation among α , β & γ

If a transistor is used to amplify a current signal, the current gain (or) current amplification factor is equal to the ratio of the output current to the input current.

Examples/Illustrations	Electronic devices
Additional inputs	Problems
Teaching Aids used	Black board, Teaching Material
References cited	Unified Books, Telugu Academy Books, others
Student Activity planned after the teaching	Preparation of Teaching Material
Activity planned outside the Class room, if any	Solving Related Problems
Any other activity	Preparation of Competitive Exam Bits based on this Lesson

P. Sainadu

Signature of the Lecturer

Commissionerate of Collegiate Education, A.P.,	
TRR Government Degree College, Kandukur, Prakasam Dt.	
Proforma for Teaching Plan	
Name of the Department/Subject :	Physics
Name of the Lecturer :	Dr. P.S.Naidu
Course/Group :	III M.P.C.
Paper :	V-ELECTRICITY,MAGNETISM AND ELECTRONICS
Name of the Topic :	Digital Electronics
Hours required :	12
Learning Objectives :	Logic gates, De Morgan's theorem
Previous knowledge to be reminded :	Arithematic operations

Topic Synopsis: There are 4 number systems

1) Decimal number system
2) Binary number system
3) Octal number system
4) Hexa decimal number system

DE MORGAN'S THEOREMS are very useful in simplifying complicated logical expressions. There are two De Morgan's theorems. 1.The compliment of the sum of two or more variables is equal to the product of the compliments of the variables.

2. The compliment of the product of two or more variables is equal to the sum of the compliments of the variables

Digital logic gates

A logic gate is an electronic circuit and it can make logic

The circuit has two or more inputs and has one out put.

The out put depends on the in puts and it is according to Boolean algebra

The general (or) primary logic gates are three.

They are 1) OR gate 2) AND gate 3) NOT gate.

NAND, NOR and Ex-OR gates

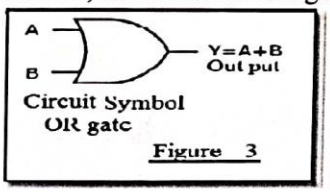


Figure 3

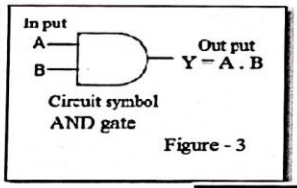


Figure - 3

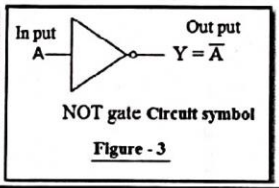


Figure - 3

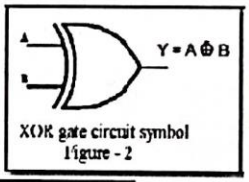
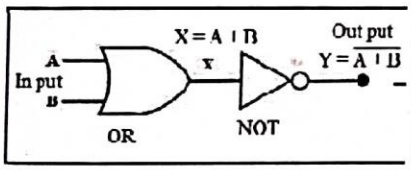
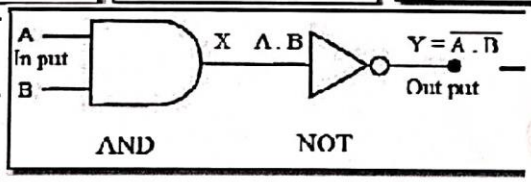


Figure - 2





Examples/Illustrations	Electronic devices
Additional inputs	Communication
Teaching Aids used	Black board, Teaching Material
References cited	Unified Books, Telugu Academy Books, others
Student Activity planned after the teaching	Preparation of Teaching Material
Activity planned outside the Class room, if any	Solving Related Problems
Any other activity	Preparation of Competitive Exam Bits based on this Lesson

Verified 3/7/2021

Area Coordinator

P. Gundu

Signature of the Lecturer

TRR GOVERNMENT DEGREE COLLEGE, KANDUKUR

TEACHING SYNOPSIS

SUBJECT: PHYSICS

PAPER V: MECHANICS, WAVES AND OSCILLATIONS

NAME OF THE TEACHER: DR. P.S.NAIDU

T.R.R. GOVT. DEGREE COLLEGE

KANDUKUR, Prakasam Dist.

2020- 2021

TEACHING PLANS

DEPARTMENT OF CHEMISTRY

NAME OF THE LECTURER :- B. Kamala babu.

Commissionerate of Collegiate Education, A.P.,		
TRR Government Degree College, KANDUKUR, 523105		
Proforma for Teaching Plan		
Name of the Department/Subject	:	Chemistry
Name of the Lecturer	:	B Kamalababu
Course/Group	:	II B.Sc.
Paper	:	V
Name of the Topic	:	Bio Inorganic Chemistry
Hours required	:	04
Learning Objectives	:	Concept of metals
Previous knowledge to be reminded	:	Metallic bond

Among the metals that are currently known to be essential for normal biological functions in humans are sodium (Na), potassium (K), magnesium (Mg), and calcium (Ca) that belong to main group of elements, and vanadium (V), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni), copper (Cu), zinc (Zn)

But man cannot live on SPONCH alone. The remaining two and a half percent of your body are largely metals – sodium, potassium, magnesium, calcium, manganese, iron, cobalt copper, zinc, and molybdenum – and despite their relatively low total mass, these elements are just as important as the first 97.5%.

The human body needs about 20 essential elements in order to function properly and among them, for certain, 10 are metal elements, though for every metal we do need, there is another one in our body we could do without it.

Zinc is found in cells throughout the body. It is needed for the body's defensive (immune) system to properly work. It plays a role in cell division, cell growth, wound healing, and the breakdown of carbohydrates. Zinc is also needed for the senses of smell and taste.

What is the biological role of copper?

Copper is an essential trace mineral necessary for survival. It is found in all body tissues and plays a role in making red blood cells and maintaining nerve cells and the immune system. It also helps the body form collagen and absorb iron, and plays a role in energy production.

What is the biological role of iron?

Iron is a mineral that our bodies need for many functions. For example, iron is part of hemoglobin, a protein which carries oxygen from our lungs throughout our bodies. It helps our muscles store and use oxygen. Iron is also part of many other proteins and enzymes

What is the biological role of potassium?

It helps your nerves to function and muscles to contract. It helps your heartbeat stay regular. It also helps move nutrients into cells and waste products out of cells. A diet rich in potassium helps to offset some of sodium's harmful effects on blood pressure.

Chromium is important in the breakdown of fats and carbohydrates. It stimulates fatty acid and cholesterol synthesis. They are important for brain function and other body processes. Chromium also aids in insulin action and glucose breakdown.

What is the role of sodium in biological system?

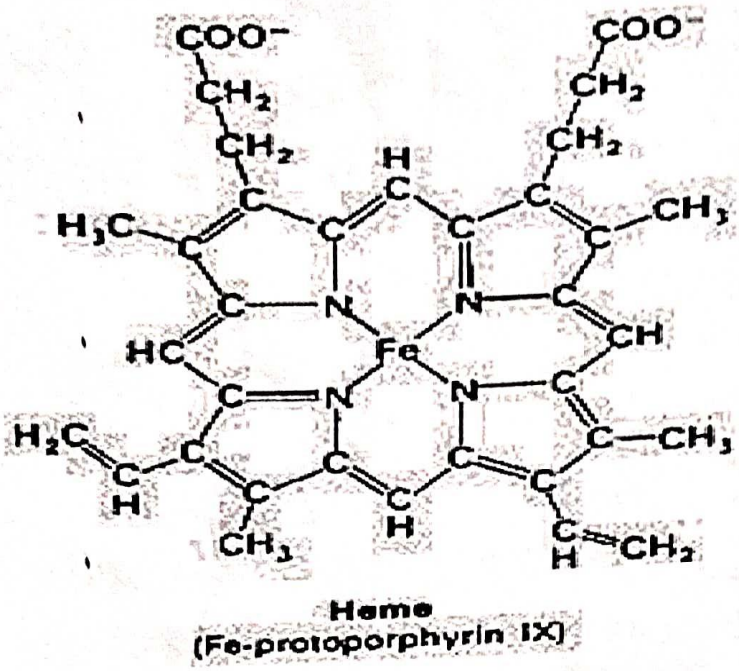
Sodium ions play a diverse and important role in many physiological processes, acting to regulate blood volume, blood pressure, osmotic equilibrium and pH

Structure and Functions of Heamoglobin:

It is a tetrameric protein and contains the heme prosthetic group attached to each subunit. It is a respiratory pigment and helps in transporting oxygen as oxyhaemoglobin from the lungs to different parts of the body. Some amount of carbon dioxide is also transported back via haemoglobin as

arbaminohaemoglobin.

Hemoglobin gives the red color to blood. Hemoglobin maintains the shape of the red blood cells. Hemoglobin acts as a buffer. Hemoglobin interacts with other ligands.
Hemoglobin serves the important role of carrying oxygen and carbon dioxide through your blood. If your hemoglobin is too low, you may not be able to supply the cells in your body with the oxygen they need to survive.



Structure and Functions of Myoglobin:

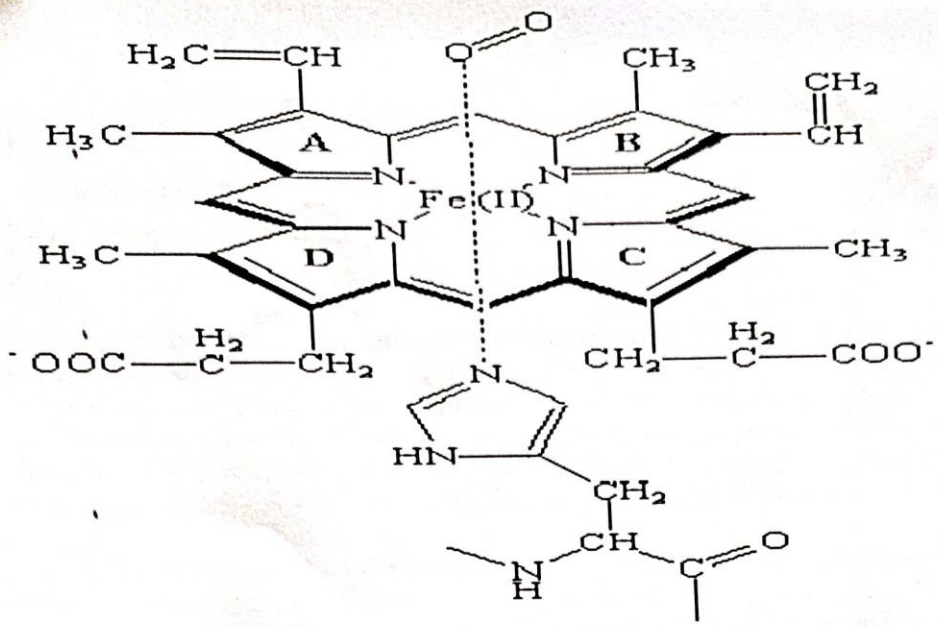
Myoglobin, an iron-containing protein in muscle, receives oxygen from the red blood cells and transports it to the mitochondria of muscle cells, where the oxygen is used in cellular respiration to produce energy. Each myoglobin molecule has one heme prosthetic group located in the hydrophobic cleft in the protein.

What is the function of myoglobin? Myoglobin is a protein that's found in your striated muscles, which includes skeletal muscles (the muscles attached to your bones and tendons) and heart muscles. Its main function is to supply oxygen to the cells in your muscles (myocytes).

Myoglobin contains a porphyrin ring with an iron at its center. A proximal histidine group (His-93) is attached directly to iron, and a distal histidine group (His-64) hovers near the opposite face. The distal imidazole is not bonded to the iron but is available to interact with the substrate O_2.

Myoglobin (Mb) is a heme-containing globular protein that is found in abundance in myocyte cells of heart and skeletal muscle. Mb and Mb-like proteins are also found in many taxa, including bacteria, plants, fungi, and animals.
What is the Colour of myoglobin?

Myoglobin is a richly pigmented protein. The more myoglobin there is in the cells, the redder, or darker, the meat. When dark meat is cooked, myoglobin's color changes depending on what the meat's interior temperature is. Rare beef is cooked to 140° F, and myoglobin's red color remains unchanged.



Toxicity of Metal ions (Hg, Pb, Cd, As):

The inhalation of mercury vapour can produce harmful effects on the nervous, digestive and immune systems, lungs and kidneys, and may be fatal. The inorganic salts of mercury are corrosive to the skin, eyes and gastrointestinal tract, and may induce kidney toxicity if ingested.

How much mercury is toxic for humans?

Blood mercury levels above 100 ng/mL have been reported to be associated with clear signs of mercury poisoning in some individuals (e.g., poor muscle coordination, tingling and numbness in fingers and toes).

Methylmercury, a highly toxic organic compound, is the form of mercury people in the United States encounter most frequently. Almost all people in the world have at least trace amounts of methylmercury in their bodies, reflecting its prevalence in the environment.
Most of the metallic mercury will accumulate in your kidneys, but some metallic mercury can also accumulate in the brain. Most of the metallic mercury absorbed into the body eventually leaves in the urine and feces, while smaller amounts leave the body in the exhaled breath.

Lead exposure can have serious consequences for the health of children. At high levels of exposure lead attacks the brain and central nervous system, causing coma, convulsions and even death. Children who survive severe lead poisoning may be left with intellectual disability and behavioural disorders

Exposure to high levels of lead may cause anemia, weakness, and kidney and brain damage. Very high lead exposure can cause death. Lead can cross the placental barrier, which means pregnant women who are exposed to lead also expose their unborn child

Lead is a highly poisonous metal affecting almost every organ in the body. Of all the organs, the nervous system is the mostly affected target in lead toxicity, both in children and adults. The toxicity in children is however of a greater impact than in adults.

Health care providers treat adults with lead levels greater than 45 mcg/dL of blood and children who can't tolerate the drug used in conventional chelation therapy most commonly with a chemical called calcium disodium ethylenediaminetetraacetic acid (EDTA).

Pencil "lead" is actually graphite which is safe and non-toxic.

How much lead paint is toxic?

Between 40 and 80 µg/dL, serious health damage may be occuring, even if there are no symptoms (seriously elevated). evidence of potential physiologic problems (elevated). exposure is occuring.

Cadmium toxicity occurs when a person breathes in high levels of cadmium from the air, or eats food or drinks water containing high levels of cadmium. Cadmium is a naturally occurring metal. It is usually present in the environment as a mineral combined with other elements like oxygen, chlorine, or sulfur. Breathing high levels of cadmium damages people's lungs and can cause death. Exposure to low levels of cadmium in air, food, water, and particularly in tobacco smoke over time may build up cadmium in the kidneys and cause kidney disease and fragile bones. Cadmium is considered a cancer-causing agent.

Only a small amount of cadmium remains in the body after eating food contaminated with cadmium, but if consumed over a long period of time, cadmium can lead to kidney disease and cause bones to become weaker. Large amounts of cadmium can damage the kidney, liver and heart and in severe cases may cause death.

A small molecule that can easily get into cells, arsenic can cause cell injury and death by multiple mechanisms. Interference with cellular respiration explains the potent toxicity of arsenic. In addition, arsine gas may interact directly with red cell membranes.

Arsenic can cause lung and skin cancers and may cause other cancers. The association between chronic arsenic exposure and cancer is strongest for skin, lung, and bladder cancer. Liver (angiosarcoma), kidney, and other cancers have limited strength of association

In addition to skin cancer, long-term exposure to arsenic may also cause cancers of the bladder and lungs. The International Agency for Research on Cancer (IARC) has classified arsenic and arsenic compounds as carcinogenic to humans, and has also stated that arsenic in drinking-water is carcinogenic to humans.

Where is arsenic commonly found?

Inorganic arsenic compounds are found in soils, sediments, and groundwater. These compounds occur either naturally or as a result of mining, ore smelting, and industrial use of arsenic. Organic arsenic compounds are found mainly in fish and shellfish.

What is a major source of arsenic?

About 70% of the world production of arsenic is used in timber treatment, 22% in agricultural chemicals, and the remainder in glass, pharmaceuticals and metallic alloys. Mining, metal smelting and burning of fossil fuels are the major industrial processes that contribute to arsenic contamination of air, water and soil.

Examples/Illustrations	Systems
Additional inputs	Different conditions
Teaching Aids used	Black board, Teaching Material
References cited	Unified Books, Telugu Academy Books, others
Student Activity planned after the teaching	Preparation of Teaching Material
Activity planned outside the Class room, if any	Solving Related Problems
Any other activity	Preparation of Competitive Exam Bits based on this Lesson

Signature of the Lecturer

Signature of the Department I/C

Signature of the Principal

A.C.