Revised Syllabus 2020-21

AUDIO VIDEO TECHNIQUE

FIRST YEAR

Paper – I Theory

Full Marks : 40

UNIT- I

Common Materials and its Properties

1. Materials
2. Conductor
3. Types of conductor
4. Properties of conductor
5. Applications of conductor
6. Insulators
7. Types of insulator
8. Soldering iron, flux and Soldering Material

UNIT- II

Basic Electronic Components

1. Resistance and its properties
2. Types of resistor
3. Combination of resistors
4. Ohm's Law
5. Kirchhoff's Laws
6. Applications of Kirchhoff's Law

7. Capacitor and its properties
8. Capacitive reactance
9. Types of capacitors
10. Combination of capacitors

UNIT- III

Semiconductor

1. Semiconductor
2. Semiconductor Materials
3. Properties of Semiconductor
4. Applications of Semiconductor
5. Types of Semiconductor
6. Diode symbol and typical
7. Construction of P-N Junction Diode
8. Characteristics of a P-N Diode
9. Applications of Diode
10. Zener Diode
11. Rectifiers
12. Half wave rectifier
13. Full wave bridge rectifiers

AUDIO VIDEO TECHNIQUE

FIRST YEAR

Paper - I Practical

Full Mark : 60

Units

1. Drawing of electrical and electronic symbols
2. Identification, testing of components and devices
3. Verification of ohm's law and Kirchhoff's law
4. Verification of V-I Characteristics of P-N junction.
5. Study of half *wave* Rectifier
6. Study of full *wave* Rectifier.

AUDIO VIDEO TECHNIQUE

FIRST YEAR
Paper – II Theory

UNIT – I

Transistor and Junction Field Effect Transistor

1. Types of Transistor
2. Construction and its properties of Transistor'
3. Transistor Terminal Identification
4. Testing of Transistors
5. Applications of Transistor
6. Transistor as an Amplifier

UNIT- II

Power Supply, Filtering and Measuring Instruments

1. Filter
2. Different filter circuits
3. Power supply regulation
4. Power supply system
5. Switch Mode Power Supply
6. Power supply troubles
7. Volt meter
8. Ammeter
9. Ohm meter
10. Multi meter

AUDIO VIDEO TECHNIQUE

FIRST YEAR

Paper – II Practical

Full Mark : 60

Units

1. Study of transistor amplifier
2. Measurement of voltage and current using multi meter
3. Design of power supply
4. Study of SMPS

AUDIO VIDEO TECHNIQUE

Second Year

Paper – III Theory

Full Marks : 40

UNIT- I

Radio

1. Modulation
2. Different Types of Modulation
3. Different Types of Radio Transmitter
4. De-Modulation
5. Different Types of Radio Receiver
6. CD and DVD Player

UNIT - II

Radio Propagation

1. Radio Wave
2. Frequency And Wave Length Relation
3. Propagation Of Radio Waves
4. Ground Wave Propagation
5. Sky Wave Propagation
6. Space Wave Propagation

UNIT - III

Television

1. Television Broadcasting System

2. Synchronization
3. Blanking
4. Video Signal
5. Band Width Required For TV Signal
6. Vestigial Side Band Signal
7. TV Receiver
8. TV Transmitter
9. CCTV

AUDIO VIDEO TECHNIQUE

Second Year

Paper – III Practical

Full Mark - 60

Units

1. Study of Radio Receiver (AM & FM)
2. Study of radio Transmitter(AM & FM)
3. Study of different section in TV receiver
4. Verification of Different Signals of IF and AF sections in Radio Receiver.
5. Study of CD and DVD player
6. Study of PA system
7. Study of CCTV system and playback equipment

AUDIO VISUAL TECHNIQUE

Second Year

Paper –IV Theory

Full Marks : 40

UNIT - I

Optical Communication

1. Advantages of Optical Fiber Communication
2. Types of Optical Fiber
3. Fiber Material
4. Fiber Bending
5. Types of Optical Sources
6. Light Emitting Diode

UNIT-II

Camera and Projector

1. Lens
2. Iris
3. Shutter
4. Film Chamber
5. View Finder
6. Light Meter
7. Lens Control
8. Sensitive Of Camera

9. White Balance

10. Audio Circuit

11. Camera Support
12. Projection Lamp
13. Setting of LCD Projector System

AUDIO VISUAL TECHNIQUE

Second Year

Paper –IV Practical

Full Mark -60

Units

1. Study of optical communication

2. Study of different types of still and digital camera

3. Practice of taking hand held shot and camera movement

4. Setting of LCD projector system

Revised Syllabus For 2020-21 session

Biology

Ist year Science(Theory)

Unit I : Diversity in living world
Unit II: Structural organization in animals and plants
Unit III: Cell structure and function
Unit IV: Plant physiology
Unit V: Human physiology

Biology

2nd year Science(Theory)

Unit I: Reproduction
Unit II: Genetics and Evolution
Unit III: Biology and Human Welfare
Unit IV: Biotechnology and its applications
Unit V: Ecology and Environment

Ist year Science(Theory)

Therory

(The no on the right is periods required excluding the deleted portion)

I. Diversity in Living World (Periods 10)

a. What is living?, Biodiversity; Need for classification; Three domains of life; Concept of species and taxonomical hierarchy; Binomial nomenclature; (02)

b. Five Kingdom classification**;** Salient features and classification of Monera, Protista andFungi into major groups; Lichens; Viruses and Viroids.

c. Salient features and classificatin of plants into major groups- Alagae, Bryophytes,Pteridophytes, Gymnosperms (three to five salient and distinguishingfeatures and at least two examples of each category); d. Salient features and classification of animals- non-chordates up to phyla level andchordates up to classes level (three to five salient features and at least two examples). (04)

II. Structural Organization in Animals and Plants (Periods 12)

a. Deleted

III.Cell Structure and Function

a . Cell theory and cell as the basic unit of life; Structure of prokaryotic and eukaryotic cell;Plant cell and animal cell; Cell envelope, cell membrance, cell wall; Cell organellesstructure and function; Endomembrance system- endoplasmic reticulum, Golgi bodies,lysosomes, vacuoles; mitochondria, ribosomes, plastids, microbodies; Cytoskeleton,,cilia, flagella, centrioles (ultra structure and function); necleus' neclearmembrance,chromatin, necleolus.

b. Chemical constituents of living cells: Biomolecules- structure and function of proteins,carbohydrates, lipid, nucleic acids; Enzymes-types, properties, enzyme action.Cell division: Cell cycle, mitosis, meiosis and theirsignificance.

IV. Plant Physiology (Period 16)

a. Deleted

b. Deleted

c. Photosynthesis in Higher Plants (This part is added)

Photosynthesis as a means of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis.

d: Respiration: Exchange of gases; Cellular respiration-glycolysis,fermentation(anaerobic), TCA cycle and electron transport system (aerobic); Energyrelation - Number of ATP molecules generated; Amphibolic pathways; Respiratory quotient.

e. Plant growth and Development: Growth regulators-auxin, gibberellin,cytokinin,ethylene, Abscilic acid (ABA);

V. Human Physiology (Periods 30)

a. Deleted

b. Breathing and Respiration: Respiratory organs in animals (tracheal, brancheal,cutaneous, pulmonary); Respiratory system in humans; Mechanism of respiration(breathing) and its regulation in humans- Exchange of gases, transport of gases,Respiratory volumes; Disorders related to respiration- Asthma, Emphysema, Occupationalrespiratory disorders. (04)

c. Body fluids Circulation: Compositon of blood, blood groups, coagulation of blood;Composition of lymph and its function; Human circulatory system- Structure and working of human heart, blood vessels; Cardiac cycle, cardiac output, ECG; Double circulation;Regulation of cardiac activity. Disorders of circulatory system- Hypertension, Coronaryarterydiesease, Angina pectoris, Heart failure. (05)

d. Excretory products and their elimination: Modes of excretion-Ammonotelism,ureotelism, uriocotelism; Human excretory system-structure and function; Mechanismof Urine formation, Osmoregulation: Regulation of kidney function- Reninangiotensin,Artial Natriuretic Factor, ADH and Diabetes insipidus; Role of other organs in excretion;Disorders- Uraemia, Renal failure, Renal calculi, Nephritis; Dialysis and artificial kidney. (05)

e. Deleted

f. Neural control and Coordination: Neuron and nerves; Nervous system in humans central nervous system (brain, spinal cord), peripheral nervous system and visceralnervous system; Generation and conduction of nerve impulse; (04)

g. Chemical coordination and Regulation: Endocrine glands and hormones; Humanendocrine system- Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Adrenal, Pancreas, Gonads; Mechanism of hormone action (Elementary Idea); Role of hormones as messengers and regulator, Hypo- and hyperactivity and related disorders (Commondisorders e.g. Dwarfism, acromegaly, cretinism, goiter, exopthlmicgoiter, diabetes,Addison's disease). (04)

(NB: Ib, c; IIa; III and IV units are to be taught by Botany Faculty. Ia, d; IIb; V units are to taught by
Zoology Faculty.)

Biology
2nd Year Science
Theory

I. Reproduction

a.

Sexual reproduction in flowering plants: Flower structure; Development of male andfemale gametophytes; Pollination-types, agencies and examples; Outbreeding devices;Pollen-Pistil interaction; Double fertilization; Post fertilization events Development ofendosperm and embryo, Development of seed and formation of fruit; Special modesapomixis,parthenocarpy, polyembryony; Significance of seed and fruit formation.

b. Human Reproduction: Male and female reproductive systems; Microscopic anatomyof testis and ovary; Gametogenesis-spermatogenesis & oogenesis; Menstrual cycle;Fertilisation, embryo development upto blastocyst formation, implantation; Pregnancyand placenta formation (Elementary idea); Parturition (Elementary idea); Lactation (Elemntary idea). (10)

Reproductive health: Need for reproductive health and prevention of sexually transmitteddiseases (STD); Birth control- Need and Methods, Contraception and Medical Terminationof Pregnancy (MTP); Amniocentesis; Infertility and assisted reproductive technologies -IVF, ZIFT, GIFT (Elementary idea for general awareness). (08)

II. Genetics and Evolution (Periods 20)

a. **Heredity and Variation:** Mendelian Inheritance; Deviations from Mendelism-Incompletedominane, Co-dominance, Multiple alleles and Inheritance of blood groups, Pleiotropy;Elementary idea of polygenic inheritance; Chromosome theory of inheritance;Chromosomes and genes; Linkage and crossing over.

b. Sex determination- In humans, birds, honey bee; Sex linked inheritance- Haemophilia,Colour blindness; Mendelian disorders in humans- Thalasemia; Chromosomal disordersin humans- Down's syndrome, Turner's and Klinefelter's syndromes. (04)

c. Molecular Basis of Inheritance: Search for genetic material and DNA as geneticmaterial; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma;Transcription, Genetic code, Translation; Gene expression and regulation- Lac Operon;Genome and human genome project; DNA finger printing.

d. Deleted

III. Biology and Human Welfare (Periods 08)

a. health and Disease: Pathogens; parasites causing human diseases (Malaria, Filariasis,Ascariasis, Typhoid, Pneumonia, common cold, amoebiasis, ring worm); Basic conceptsof immunology- vaccines; Cancer, HIV and AIDS; Adolescence, drug and alcohol abuse. (04)

b. Improvement in food production:

i) , Biofortification;

ii)

c. Microbes in human welfare: In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers.

IV. Biotechnology and its Applications (Periods 08)

a. Principles and process of Biotechnology: Genetic engineering (Recombinant DNAtechnology). (04)

b. Application of Biotechnology in health and agriculture: Human insulin and vaccineproduction, gene therapy; Genetically modified organisms- Bt crops; Transgenic Animals; Biosafety issues- Biopiracy and patents. (04)

V. Ecology and environment (Periods 12)

a. Organisms and environemnt: Habitat and niche; Population and ecological adaptations;population interactions-mutualism, competition, predation, parasitism; Populationattributes-growth, birth rate and death rate, age distribution.

b. Deleted

c. Biodiversity and its conservation: Concept of Biodiversity; Patterns of Biodiversity;Importance of Biodiversity; Loss of Biodiversity,

conservation; Hotspots, endangeredorganisms, extinction, Red Data Book: Biosphere reserves, National parks andSanctuaries.

Environmental issues: Deleted

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(NB: Ia, II a, c; III b (i), c and v units are to be taught by Botany Faculty. I b; II b; III a, b(ii); IV units
are to be taught by Zoology Faculty.)

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QUESTION PATTERN AND DISTRIBUTION OF MARKS
BIOLOGY - II Theory
+ 2 Second Year Science
Section A - Botany
Time : 1.5 hours Full Marks : 35
Group A: (Objective Type- Compulsory)
Q1.- Multiple choice/ one word answer : 1 mark each x 5 = 5 marks
Q2.- Correct the sentences/ Fill up the blanks : 1 marks each x 5 = 5 marks
Group B: (Short Answer Type)
Q3.- Answer within three sentences : 2.5 marks each x 3 = 7.5 makrs
Q4.- Difference between (3 important differences)
(1 bit to be answered out of 3 bits) : 3.5 marks = 3.5 marks
Group C: (Long Answer Type)
Answer two questions out of four : 7 marks x 2 = 14 marks
Section B - Zoology
Time : 1.5 hours Full Marks : 35
Group A: (Objective Type- Compulsory)
Q1.- Multiple choice/ one word answer : 1 mark each x 5 = 5 marks
Q2.- Correct the sentences/ Fill up the blanks : 1 marks each x 5 = 5 marks
Group B: (Short Answer Type)
Q3.- Answer within three sentences : 2.5 marks each x 3 = 7.5 makrs
(3 bits to be answered out of 6 bits)
Q4.- Difference between (3 important differences)
(1 bit to be answered out of 3 bits) : 3.5 marks = 3.5 marks
Group C: (Long Answer Type)
Answer two questions out of four : 7 marks x 2 = 14 marks
N.B: Long answer type questions are to be set only from the portions understand in the syllabus.

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BIOLOGY - II (Botany) Practical
+2 Second Year Science
Detailed Syllabus
Major Experiment:
1. Study of the effect of temperature and chemicals (ethanol, acetone, formaldehyde) on leachingof pigments in beet root.

2.
3. Study of transpiration by Ganong's or Farmer's potometer.
4. Study of relation between transpiration and absorption by T/A apparatus.
5. Effect of different wave length of light on photosynthesis by Wilmott's bubbler.
6.
7.
8. Collect and study soil from at least two different sites and study them for texture, moisturecontent, pH and water holding capacity of soil. Correlate with the kinds of plants found inthem.
9.
10.
11. Study of plant population density by quadrate method.
12. Study of plant population frequency by quadrate method.

Minor Experiments:

13. Study of pollen germination on a slide.
14. Study of distribution of stomata on upper and lower surface of a dicot and a monocot leaf.
15. Study of osmosis by potato osmometer.
16
17. Study of plasmolysis.

Spotting:

18. Conditions necessary for seed germination.
19.
20. Phototropism/
21. Morphological adaptation of hydrophyte and Xerophyte.

QUESTION PATTERN AND DISTRIBUTION OF MARKS
BIOLOGY - II (Botany) Practical
+ 2 Second Year Science

1. Major experiment (One) : 7 marks
2
2. Spotting (Two) : 3 marks
3. Viva voce: 3 marks (Recommended by Syllabus committee)
4. Record : 2 marks

Total : 15 Marks

Instruction:

5. All the above experiments should be conducted by individual student.
6. Questions for major and minor experiments are to be set by drawing lots.
7. For each major and minor experiments, candidates have to write the requirements as per
their questions which may be verified and signed by the external examiner only.

8. One observation for major experiment may be verified and signed by the external examiner
only.

Section B - Zoology (Theory) First year

Time : 1.5 hours Full Marks : 35

Group A: (Objective Type - compulsory)

Q1.- Multiple choice/ one word answer : 1 mark each x 5 = 5 marks

Q2.- Correct the sentences/ Fill upthe blanks :1 marks each x 5 = 5 marks **Group B: (Short Answer Type)**

Q3.- Answer within three sentences : 2.5 marks each x 3 = 7.5 marks (3 bits to be answered out of 6 bits)

Q4.- Differentiate between (3 important differences) (1 bit to be answered out of 3 bits) : 3.5 marks = 3.5 marks

Group C: (Long Answer Type)

Answer two questions out of four : 7 marks each x 2 = 14 marks N.B: Long answer type questions are to be set only from the portions underlined in the syllabus.

BIOLOGY - I (Zoology) Practical +2 First year Science Detailed Syllabus

A. EXPERIMENTS/ OBSERVATIONS:

1. To test the presence of carbohydrate, protein and fat in suitable animal materials (qualitative only).

B. SPOTTINGS/ IDENTIFICATION:

a. Study of specimens and identification with reasons- Amoeba, Hydra, Sycon, Liver fluke, Earthworm, Leech, Cockroach, Prawn, , Snail and Starfish.

b. Study of squamous epithelium, muscle fibres and mammalian blood film; (temporary/ permanent slides).

c. Study and comment on the morphological adaptations of two animals (Tree frog, Bat) found in terrestrial conditions and two animals (Flying fish,) found in aquatic conditions.

Book Recommended : Bureau's Higher Secondary (+2) Zoology, Practical, Published by Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar.

QUESTION PATTERN AND DISTRIBUTION OF MARKS

BIOLOGY - I (Zoology) Practical +2 First year Science (For College Level Exam) Time : 2 hours Full marks : 15

1. Experiment (One experiment to be set from A) : 07 marks

Theory and Procedure - 03 marks Experiment,

Observation and Results - 04 marks

2. Spotting (2 spots to be set from B) - 1.5 marks x 2 : 03 marks (one from bit a, one from bit b or c)

3. Viva voce :03

4. Practical Record : 02 marks

QUESTION PATTERN AND DISTRIBUTION OF MARKS
BIOLOGY - II Theory + 2 Second Year Science

Section B - Zoology

Time : 1.5 hours Full Marks : 35

Group A: (Objective Type- Compulsory)

Q1.- Multiple choice/ one word answer : 1 mark each x 5 = 5 marks

Q2.- Correct the sentences/ Fill up the blanks : 1 marks each x 5 = 5 marks

Group B: (Short Answer Type)

Q3.- Answer within three sentences : 2.5 marks each x 3 = 7.5 makrs (3 bits to be answered out of 6 bits)

Q4.- Difference between (3 important differences) (1 bit to be answered out of 3 bits) : 3.5 marks = 3.5 marks

Group C: (Long Answer Type)

Answer two questions out of four : 7 marks x 2 = 14 marks

N.B: Long answer type questions are to be set only from the portions underlined in the syllabus.

BIOLOGY - II (Zoology) Practical +2 Second year Science Detailed Syllabus

A. EXPERIMENTS/ OBSERVATIONS:

1. To test the action of salivary amylase on starch;
2. To test the presence of urea sugar in urine/ given sample solution.
3. To determine the pH of three water samples collected from water bodies (using pH paper).
4.

B. SPOTTINGS/ IDENTIFICATION:

a. Study of specimens and identification with reasons- Shark, Rohu, Frog, Garden lizard, Cobra, Krait, Pigeon and Rat.

b. TS/ VS through spinal cord, ovary, testis, kidney, stomach .

c. appendicular skeleton of rabbit. (Girdles, Humerus, radius & Ulna, Femur, Tibia & Fibula.

d.

Book Recommended : Bureau's Higher Secondary (+2) Zoology, Practical, Published by Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar.

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QUESTIONS PATTERN AND DISTRIBUTION OF MARKS BIOLOGY - II (Zoology) Practical + 2 Second Year Science

Time : 2 hours Full Marks : 15

1. Experiment (One experiment to be set from A) : 07 marks
   Theory and procedure - 03 marks
   Experiment, Observation and Results - 04 marks
2. Spotting (Two spots to be set from B) -1.5 marks each x 2 : 03 marks
3. Viva voce:03
4. Practical Record :02 marks

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Revised Syllabus For The session 2020-21

CHEMISTRY

for 1st year Science

Unit I: Some Basic Concepts of Chemistry

Atomic and molecular masses and equivalent mass of elements, acid, base, and salt,oxidants,reductants, and mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry, expression of concentration of solutions.

Unit II: Structure of Atom

Atomic number, isotopes, isobars, Rutherford's model and its limitations, Bohr's model and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals – Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half filled and fully filled orbitals.

Unit III: Classification of Elements and Periodicity in Properties

Modern periodic law and the present form of periodic table, periodic trends in properties of elements - atomic radii ionic radii, inert gas radii, Ionization enthalpy, electron gain enthalpy, electronegativity, valency and oxidation state. Nomenclature of elements with atomic number greater than 100.

Unit IV : Chemical Bonding and Molecular Structure

Valence electrons, ionic bond, covalent bond; bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s, p and d orbitals and shapes of some molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only), hydrogen bond.

Unit V : States of Matter : Gases and Liquids

Role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles law, Gay Lussac's law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro's number, ideal gas equation. Deviation from ideal behaviour liquefaction of gases, critical temperature, kinetic energy and molecular speeds (elementary idea).

Unit VI : Chemical Thermodynamics

Concepts of System and surroundings and types of system, surroundings, work, heat, energy, extensive and intensive properties, state functions.

First law of thermodynamics - Internal energy and enthalpy. Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, neutralization, atomization, sublimation, phase transition, ionization, solution and dilution, Second law of

Thermodynamics (brief introduction). Introduction of entropy as a state function, Gibb's energy change for spontaneous and non-spontaneous processes, criteria for equilibrium.
Third law of thermodynamics (Statement only).

Unit VII : Equilibrium

Equlibrium in physical and chemical processes, dynamic nature of equlibrium, law of mass action, equilibrium constant (Kc, Kp and Kx and their relationship), factors affecting equilibrium, Le- Chatelier's principle, ionic equilibrium, ionization of acids and bases, strong and weak electrolytes, degree of ionization, concept of PH, hydrolysis of salts (elementary idea), buffer solution, Henderson Equation, solubility, product, common ion effect (with illustrative examples) numerical problems.

Unit VIII : Redox Reaction

Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number.

Unit IX : Hydrogen

Position of hydrogen in periodic table, occurrence, isotopes, preparation, properties and uses of hydrogen, hydrides-ionic, covalent and interstitial; physical and chemical properties of water, heavy water and use of hydrogen as a fuel.

Unit X : s-Block Elements (Alkali and Alkaline Earth Metals)

Group 1 and Group 2 Elements

General introduction, electronic configuration, occurrence, anomalous, properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen and halogens, uses.

Unit XI : Some p- Block Elements

General Introduction to p- Block Elements

Group 13 Elements : General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group, Boron - physical and chemical properties.

Group 14 Elements : General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first elements. Carbon-catenation, allotropic forms, physical and chemical properties; uses of some important compounds: oxides. Important compounds of Silicon, Silicones, Zeolites and their uses.

Unit XII : Organic Chemistry - Some Basic Principles and Technique

General introduction, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond, inductive effect, electromeric effect, resonance and hyperconjugation. Homolytic and heterolytic fission of a covalent bond free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

Unit XIII : Hydrocarbons

Classification of Hydrocarbons

Aliphatic Hydrocarbons :

Alkanes - Nomenclature, isomerism, conformation (ethane only), methods of preparation from unsaturated hydrocarbons, alkyl halides, carboxylic acids (Decarboxylation and Kolbes electrolytic method), physical properties, chemical reactions: including free radical mechanism of halogenation, combustion, controlled oxidation, isomerisation, aromatisation, with steam and pyrolysis.

Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, methods of preparation from alkynes, alkyl halides, vicinal dihalides, alcohols, physical properties, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides, sulphuric acid (Markownikoff's addition and peroxide effect), ozonolysis, oxidation, polymerisation and mechanism of electrophilic addition reaction.

Alkynes - Nomenclature, structure of triple bond (ethyne), methods of preparation, from calcium carbide, vicinal dihalides, physical properties, chemical reactions : acidic character of alkynes, addition of hydrogen, halogens, hydrogen halides, water, and polymerisation.

Aromatic Hydrocarbons : Introduction, IUPAC nomenclature, benzene : resonance, aromaticity, preparation of benzene from acetylene, phenol and aromatic acids, chemical properties: mechanism of electrophilic substitution, nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, addition of hydrogen, addition of chlorine, combustion.

CHEMISTRY (PRACTICAL)

+2, 1st Year Science

(Detailed syllabus)

Experiments :

1. Basic Laboratory Techniques : (Non-evaluative)

a) Bunsen burner (different parts and their functions)

b) Chemical balance - weighing with chemical balance by equal oscillation method.

c) Cutting and bending of glass tube, drawing jet and boring a cork.

2. Crystallisation :

Preparation of $CuSO_4$, $5H_2O$ crystal from $CuCO_3$.

3. Qualitative Analysis :

a) Identification of acid radicals :

Radicals : CO_3^{2-}, SO_3^{2--}, S^{2-}, NO^{2-}, Cl^-, Br^-, I^-, NO_3^-, SO_4^{2--} & PO_4^{3-}.

b) Identification of Basic Radicals :

Radicals : Ag^+, Pb^{2+}, Hg_2^{2+}, Cu^{2+}, Hg^{2+}, Bi^{3+}, As^{3+}, Sb^{3+}, Sn^{2+}, Al^{3+}, Fe^{3+}, Cr^{3+}, Co^{2+}, Ni^{2+}, Zn^{2+}, Mn^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, NH_4^+, Mg^{2+} , K^+ and Na+ (Dry Tests only).

4. Volumetric Analysis :

Single titration of acids and bases (three experiments to be done; one on direct determination of
normality of one of the solutions from that of the other and the other two, involving numerical calculations)

QUESTION PATTERN AND DISTRIBUTION OF MARKS

CHEMISTRY (PRACTICAL)

+2, 1st year Science

Full Mark : 30 Time : 3 Hrs

1. Salt analysis (Acid radical) - - 10 marks

Dry Test - 04 mark

Wet Test - 06 mark

2. Crystallisation / Single titration –10 marks

3. Viva-Voce - - 06 marks

4. Record - - 04 marks

CHEMISTRY

for 2nd year Science

Unit I: Solid State

Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea). Unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects.

Unit II: Solutions

Types of solutions, solubility of gases in liquids, solid solutions, colligative properties, relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, Abnormal colligative properties (Preliminary idea only).

Unit III: Electrochemistry

Electrolytes and non-electrolyte conductor, conductance in electrolytic solutions, specific and molar conductivity, variation of conductivity with concentration, Kohlrausch's law, electrolysis and laws of electrolysis (elementary idea), dry cell electrolytic cells and Galvanic cells, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and emf of a cell.

Unit IV: Chemical Kinetics

Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst, order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment), Activation energy, Arrhenius equation.

Unit V: Surface Chemistry

Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, catalysts, colloidal state distinction between true solutions, colloids and suspension; lyophilic, lyophobic, multimolecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation, emulsion - types of emulsions.

Unit VI: General Principles and Processes of Isolation of Elements

Principles and methods of extraction - concentration, oxidation, reduction - electrolytic method and refining.

Unit VII: p - Block Elements

Group15 Elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; nitrogen preparation properties & uses; compounds of nitrogen, preparation and properties of ammonia, oxides of nitrogen (Structure only); Phosphorus – allotropic forms.

Group 16 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties, dioxygen: Preparation, Properties and uses, classification of oxides, Ozone, Sulphur allotropic forms; compounds of sulphur: Preparation properties and uses of sulphur dioxide, sulphuric acid, properties and uses; oxoacids of sulphur (Structures only).

Group 17 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens, Preparation properties and uses of chlorine and hydrochloric acid, interhalogen compounds, oxoacids of halogens (structure only).

Group 18 Elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

Unit VIII: d and f Block Elements

General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals - metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation.

Unit IX: Coordination Compounds

Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT and CFT.

Unit X: Haloalkanes and Haloarenes

Haloalkanes: Nomenclature, nature of C-X bond, preparation from alcohols, halogenations of alkanes, alkenes, Sandmeyer's reaction, halogen exchange reaction, physical properties and chemical properties, nucleophilic substitution reactions (unimolecular and bimolecular), stereochemical effect of substitution reaction, elimination reaction, Electrophilic substitution reactions (halogenations, nitration, sulphonation), Friedel-Crafts reaction, reaction with metals (Wurtz Fittig and Fittig reaction), optical rotation.

Haloarenes: Nature of C - X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only.

Unit XI: Alcohols, Phenols and Ethers

Alcohols: Nomenclature, methods of preparation, from alkenes, carbonyl compounds, Grignard reagent, physical properties and chemical properties (of primary alcohols only),esterification, reaction with (hydrogen halide, phosphorus trihalide Oxidation (identification of primary, secondary and tertiary alcohols mechanism of dehydration).

Phenols: Nomenclature, methods of preparation from haloarenes, benzene sulphonic acid, diazonium salt, cumene, physical properties and chemical properties, acidic nature of phenol, esterification, Electrophilic aromatic substitution (halogenations, nitration) Reimer-Tiemann reaction, reaction with Zn dust, oxidation.

Eithers : Nomenclature, methods of preparation dehydration of alcohols, Williamson synthesis, physical properties and chemical properties, formation of alcohols, Electrophilic substitution (halogenations, nitration, Friedel-Craft reaction.

Unit XII : Aldehydes, Ketones and Carboxylic Acids

Aldehydes and Ketones : Nomenclature nature of carbonyl group methods of preparation, from alcohols (oxidation and dehydrogenation), ozonolysis of alkenes, hydration of alkynes, preparation of ketones from acyl chlorides and nitriles, preparation of acetone by Friedel-Craft acylation reaction, physical properties and chemical properties, nucleophillic addition reaction with hydrogen cyanide, sodiumhydrogen sulphite, reaction with NH_3 and NH_2-G compounds (Hydrazine, hydroxyl amine, semicarbazide, phenyl hydrazine, 2,4-dinitro phenylhydrazine), alcohol, Grignard reagent, Clemmensen reaction, Wolff-Kishner reduction, Fehling's Test, Tollen's Test, haloform reaction, Aldol condensation, Cannizzaro's reaction, special reaction of (formaldehyde with ammonia and acetone with concentrated sulphuric acid), Electrophilic substitution reactions of aromatic aldehydes and ketones.

Carboxylic Acids : Nomenclature, acidic nature, methods of preparation, from primary alcohols, aldehydes, anhydrides, esters, nitriles and Grignard reagent, preparation of benzoic acid from toluene and benzanilide, physical properties, chemical properties, reaction with (metals, alkalies, PCl_3, PCl_5, $SOCl_2$, NH_3), formation of anhydride, esterification, reduction, decarboxylation, Hell-Volhard-Zelinsky reaction. Substitution reaction of benzoic acid (nitration, bromination)

uses.

Unit XIII : Organic compunds containing Nitrogen

Amines : Nomenclature classification, structure, methods of preparation, reduction of (nitrocompounds, nitriles, amides) amonolysis of alkyl halides, Hoffmann bromamide degradation, Gabriel phthalamide synthesis. Physical properties and chemical proporties, basic character of amines, alkylation, acylation, carbylamines reaction, identification of primary, secondary and teritary amines (reaction with nitrous acid and arylsulphonyl chloride). Electrophilic substitution reactions of aniline (nitration, sulphonation, bromination). Cyanide and Isocyanides-will be mentioned at relevant places in context.

Unit XV: Polymers

Classification-Natural and synthetic methods of polymerization(addition and condensation)co polymerization, some important polymers, natural and synthetic like polythene, nylon, polyester, bakelite, rubber, Biodegradable and non-biodegradable polymers.

Unit XVI : Chemistry in Everyday life

Chemical in Medicines- Angesics, traqulizers antiseptics, disinfectants, antimicrobials, antifungal, drugs, antibiotics, antacids, antihistamines.

Cleansing agents – Soap & detergents, cleansing action

CHEMISTRY (PRACTICAL)

+2, 2nd Year Science

(Detailed syllabus)

1. Crystallisation

a) Preparation of Mohr's Salt ($FeSO_4$, $(NH_4)_2SO_4$, $6H_2O$] crystal

b) Preparation of potash alum [$K_2Al_2(SO_4)_3$, $24H_2O$] crystal

2. Quantitative Analysis :

Double titration : Two experiments to be done - i) one acid two alkalis double titration and ii) two acids one alkali double titration.

3. Qualitative Inorganic Analysis :

Wet tests for basic radicals : Wet tests for the following basic radicals be done.

Group-I basic radicals : Ag^+, Pb^{2+}, Hg_2^{2+}

Group-II basic radicals : Hg^{2+}, Cu^{2+}, Bi^{3+}, As^{3+}, Sb^{3+}, Sn^{2+} & Sn^{4+}

Group-IIIA basic radicals : Fe^{3+}, Al^{3+} & Cr^{3+}

Group-IIIB basic radicals : Co^{2+}, Ni^{2+}, Zn^{2+} & Mn^{2+}.

Group-IV basic radicals : Ba^{2+}, Ca^{2+} & Sr^{2+}.

Group-V basic radicals : NH_4^+, Mg^{2+}, K^+, Na^+.

Identification of unknown basic radicals.

[For Identification of unknown basic radicals both dry and wet tests are to be performed]

QUESTION PATTERN AND MARKS DISTRIBUTION

CHEMISTRY (PRACTICAL)

+2, 2nd year Science

Full Mark : 30 Time : 3 Hrs

1. Salt analysis (Identification of basic radical only) 10 marks

Dry Test -- 04 mark

Wet Test -- 06 mark

2. Crystallisation / Double Titration -- 10 marks

3. Viva-Voce - - 06 marks

4. Record - - 04 marks

Modified Syllabus 2020-21

MATHEMATICS (+2 2nd year)
Course Structure

UNIT - I : Relations and Functions

1. Relations and Functions

Types of relations; reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of function. Binary operations.

2. Inverse Trigonometric Functions

Definition, range, domain, principle value branch.

3. Linear Programming

Introduction, related terminology such as constraints, objective function, optimization, different types of linear programming (L.P.) problems, mathematical formulation of L.P. problems, graphical method of solution for problems in two variables

UNIT - II : Algebra

1. Matrices

Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices; Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2). concept of elementary row and column operations

2. Determinants

Determinant of a square matrix (up to 3×3 matrices), properties of determinants, minors, co-factors and applications of determinants in finding the area of a triangle, Adjoint and inverse of a square matrix. solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

UNIT-III : Differential Calculus

1. Continuity and Differentiability

Continuity and differentiability, derivative of composite functions, chain rule, derivatives of inverse trigonometric functions, derivative of implicit functions. Concept of exponential and logarithmic functions.

Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivativesNo problems on Mean Value Theorems.

2. Applications of Derivatives

Applications of derivatives : , increasing and decreasing functions, tangents and normals, , maxima and minima (first derivative test motivate geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).

UNIT-IV Integral Calculus

1. Integrals

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problems based on them.

$$\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{a^2 - x^2}, \int \frac{dx}{ax^2 + bx + c}$$

$$\int \frac{dx}{ax^2 + bx + c}, \int \frac{px + q}{ax^2 + bx + c} dx,$$

$$\int \frac{px + q}{ax^2 + bx + c} dx, \int \sqrt{a^2 \pm x^2}\, dx,$$

Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.

2. Applications of the Integrals

Applications in finding the area under simple curves, especially lines, circles/parabolas/ ellipses (in standard form only). Area between any of the two above said curves (the region should be clearly identifiable).

3. Differential Equations.

Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type :

$\frac{dy}{dx} + py = q$, where p and q are functions of x or constants.

UNIT - V : Vectors and Three-Dimensional Geometry

1. Vectors

Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors .

2. Three - dimensional Geometry

Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Distance of a point from a plane.

Books Recommended:

Bureau's Higher Secondary (+2) Elements of Mathematics, Part-II, Published by Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar.

MATHEMATICS
(+2 First Year)

UNIT - I : Sets and Functions

1. Sets

Sets and their representations. Empty set, Finite and Infinite sets, Equal sets, Subsets, Subsets of a set of real numbers especially intervals (with notations), Power set, Universal set, Venn diagrams, Union and Intersection of sets, Difference of sets, complement of a set, Properties of Complement of Sets, Practical Problems based on sets.

2. Relations & Functions

Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the sets of real (up to R × R). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain co-domain and range of a function. Real valued functions, domain and range of these functions: Constant, identity, polynomial, rational, modulus, signum, exponential, logarithmic and greatest integer function, with their graphs.

3. Trigonometric Functions

Positive and negative angles. Measuring angles in radians and in degrees and conversion of one into other. Definition of trigonometric functions with the help of unit circle. Truth of $\sin^2 x + \cos^2 x = 1$, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing $\sin(x \pm y)$ and $\cos(x \pm y)$ in terms of $\sin x$, $\sin y$, $\cos x$ & $\cos y$ and their simple application. Deducing identities like the following :

$$\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}, \quad \cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$$

$$\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2}, \quad \cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2},$$

$$\sin x - \sin y = 2 \cos \frac{x+y}{2} \sin \frac{x-y}{2}, \quad \cos x - \cos y = -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2},$$

Identities related to sin 2x, cos 2x, tan 2x, sin 3x, cos 3x and tan 3x. Trigonometric equations Principal solution.

UNIT-II : Algebra

1. Principle of Mathematical Induction

Process of the proof by induction, motivation the application of the method by looking at natural numbers as the least inductive subset of real numbers. The principle of mathematical induction and simple applications.

2. Complex Numbers and Quadratic Equations

Need for complex numbers, especially $\sqrt{-1}$, to be motivated by inability to solve some of the quadratic equations; Algebraic properties of complex numbers. Argand plane. Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex system. cube roots of unity and its properties.

3. Linear Inequalities

Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Graphical solution of system of linear inequalities in two variables.

4. Permutations and Combinations

Fundamental principle of counting, factorial n. (n!), Permutations and combinations, , simple applications.

5. Binomial Theorem

History, statement No problems on Binomial Theorem

6. Sequence and Series

Sequence and Series, Arithmetic Progression (A.P.). Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P, sum of n terms of a G.P., Arithmetic and Geometric series, infinite G.P. and its sum, geometric mean (G.M.), Harmonic (mean) relation between A.M., GM. and H.M.,

UNIT - III : Co-ordinate Geometry

1. Straight Lines

Brief recall of two dimensional geometry from earlier classes. Slope of a line and angle between two lines. Various forms of equations of a line : parallel to axis, point-slope form, slope-intercept form, two-point form, intercept form and normal form. General equation of a line. Equation of family of lines passing through the point of intersection of two lines. Distance of a point from a line,.

2. Conic Sections

Sections of a cone : circles, ellipse, parabola, hyperbola; Standard equations and simple properties of Circle, parabola, ellipse and hyperbola.

3. Introduction to Three-dimensional Geometry

Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.

UNIT-IV: Calculus

1. Limits and Derivatives

Derivative introduced as rate of change both as that of distance function and geometrically. Intuitive idea of limit. Limits of polynomials and rational functions,

trigonometric, exponential and logarithmic functions. Definition of derivative, relate it to slope of tangent of a curve, derivative of sum, difference, product and quotient of functions. The derivative of polynomial and trigonometric functions.

UNIT-V : Mathematical Reasoning

1. Mathematical Reasoning

Mathematically acceptable statements. Connecting words/phrases-consolidating the understanding of "if and only if (necessary and sufficient) condition," "implies", "and/ or", "implied by", "and", "or", "there exists" and their use through variety of examples related to real life and Mathematics.

UNIT-VI : Statistics and Probability

1. Statistics

Measures of dispersion; Range, mean deviation, variance and standard deviation of ungrouped/ grouped data.

Random experiments; outcomes, sample spaces (set representation). Events; occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Probability of an event. Probability of 'not', 'and' 'or' events.

Books Recommended:

Bureau's Higher Secondary (+2) Elements of Mathematics, Part-I, Published by Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar.

Revised Syllabus for the session 2020-21

PHYSICS (Theory)

+2 1st Year Science

Unit-I Physical world and Measurement (6 Periods)

Sl Units, accuracy and precision of measuring instruments, errors in measurement, absolute, relative error, percentage of error, Combination of errors, significant figures.

Dimensions of Physical quantities. Dimensional analysis and its applications.

Unit – II Kinematics. (18 Periods)

1. Motion in a straight line:

Rest and motion, Frame of reference, motion in a Straight line, position – time graph, speed and velocity, uniform and non-uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity – time and position – time graph, Relation for uniformly accelerated motion (graphical treatment)

2. Motion in a plane:

Scalars and vectors, general vectors and their notations, position and displacement vectors, equality of vectors, unit vectors, multiplication of vectors by a real number, addition and subtraction of vectors, relative velocity, resolution of a vector in a plane, rectangular components, Dot and Cross products of two vectors.

Motion in a plane, cases of uniform velocity and uniform acceleration – projectile motion; uniform circular motion.

Unit-III Laws of Motion (10 Periods)

Concept of force, inertia, momentum, impulse, impulse-momentum theorem, Newton's Laws of motion, Law of Conservation of linear momentum and its application.

Static and Kinetic friction, laws of friction, rolling friction.

Dynamics of uniform circular motion, Centripetal force, motion of a vehicle on a level circular road and vehicle on a banked road.

Unit-IV Work, Energy and Power (10 Periods)

Work done by a Constant force and variable force, kinetic energy, work- energy theorem, power.

Notion of potential energy, conservative and non-conservative forces, conservation of mechanical energy (Kinetic and Potential energies), elastic and in-elastic collisions in one dimension, coefficient of restitution.

Unit-V Motion of System of Particles and Rigid bodies: (12 Periods)

System of Particles and Rotational Motion:

Centre of mass of a two-particle system, momentum conservation and centre of mass motion, centre of mass of rigid bodies, Centre of Mass of a uniform rod.

Moment of a force, torque, angular momentum, conservation of angular momentum with its applications.

Moment of inertia, radius of gyration, moment of inertia of simple geometrical objects (no derivation).

Unit-VI Gravitation (08 Periods)

Newton's law of gravitation, Gravitational field and Potential, gravitational potential energy, acceleration due to gravity and its variation with altitude and depth, Escape velocity, orbital velocity of a satellite.

Unit-VII Properties of Bulk Matter (18 Periods)

1. Mechanical properties of Solids:

Elastic Behaviours, Stress, Strain, Hooke's Law, Stress-Strain diagram, Young's modulus, Bulk modulus, Shear modulus of rigidity, Poisson's ratio, elastic energy.

2. Mechanical properties of fluids:

Surface energy and surface tension, angle of contact, excess pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.

Viscosity, Stoke's law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its application.

3. Thermal properties of matter:

Concepts of heat and temperature, Thermal expansion of solids, liquids and gases, specific heat capacity: Cp, Cv. Calorimetry, change of state, latent heat capacity.

Heat transfer: Conduction, Convection and radiation, thermal conductivity, qualitative ideas of block body radiation, Wien's displacement law, Stefan's law. **Unit-VIII Thermodynamics (10 Periods)**

Thermal equilibrium, definition of temperature (Zeroth law of thermodynamics) heat, work and internal energy. First law of thermodynamics, isothermal and adiabatic processes, second law of thermodynamics, reversible and irreversible processes, Carnot's engine and its efficiency (no derivation).

Unit-IX Kinetic theory of gases: (04 Periods)

Equation of state of a perfect gas, work done in compressing a gas. Pressure exerted by an ideal gas (elementary idea), kinetic interpretation of temperature, mean and RMS speed of gas molecules, degrees of freedom, law of equipartition of energy (statement only) and its applications to specific heat of gases.

Unit-X Oscillation and waves (18 Periods)

1. Periodic motion: Period, Frequency, displacement as a function of time, periodic function. Simple harmonic motion and its equation, phase, oscillation of a spring, Restoring force and force constant, kinetic and potential energy in SHM, simple pendulum, derivation of expression for its time period.

2. Waves:

Wave motion, transverse and longitudinal waves, speed of wave motion, displacement relation for a progressive wave, speed of longitudinal wave in an elastic medium and speed of transverse wave in a stretched string (qualitative idea only), principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes.

***** UNIT WISE MARK DISTRIBUTION (Physics Theory) and QUESTION WISE BREAK UP REMAINS THE SAME AS THEIR IN EARLIER SYLLABUS.***

PRACTICALS

Total Periods 40

Section A

Experiments

1. To measure diameter of a small spherical/cylindrical body using Vernier calipers and to measure internal diameter and depth of a given beaker/calorimeter using Vernier calipers and hence find its volume.
2. To measure diameter of a given wire and thickness of a given sheet using screw gauge.
3. To measure volume of an irregular lamina using screw gauge.
4. To determine radius of curvature of a given spherical surface by a spherometer.
5. To determine the mass of two different objects using a beam balance.
6. To find the weight of a given body using parallelogram law of vectors,
7. Using a simple pendulum, plot L-T^2 graph and hence find the effective length of a second's pendulum.

Section B

Experiments

1. To determine young's modulus of elasticity of the material of a given wire.
2. To determine the surface tension of water by capillary rise method.
3. To determine the coefficient of viscosity of a given viscous liquid by measuring the terminal velocity of a given spherical body.
4. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.
5. To study the relation between frequency and length of a given wire under constant tension using sonometer.
6. To study the relation between the length of a given wire and tension for constant frequency using sonometer.
7. To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.

PHYSICS (Theory)
+2 2nd Year Science

Unit-I Electrostatics (16 Periods)

1. Electric charges and fields:

Electric charge and its quantization, conservation of charge, Coulomb's law, force between two point charges, force between multiple charges, superposition principle, Continuous change distribution.

Electric field due to a point charge, electric field lines, electric field due to a dipole at any point, torque on a dipole in uniform electric field.

Electric flux, Gauss's theorem (statement only) and its applications to find field due to uniformly charged infinite plane sheet, infinitely long straight wire.

2. Electrostatic potential and capacitance:

Electric potential, potential difference, electric potential due to a point charge, potential due to a dipole, potential due to a system of charges. Equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field.

Conductors, insulators, free charges and bound charges inside a conductor, Dielectrics and electric polarization, capacitors and capacitance, capacitance of

a parallel plate capacitor with and without dielectric medium between the plates, combination of capacitors in series and in parallel, energy stored in a capacitor.

Unit- II Current Electricity: (14 Periods)

Electric current, drift velocity, mobility and their relation with electric current, Ohm's law, electrical resistance, conductance, resistivity, conductivity, effect of temperature on resistance, V – I characteristics (linear and non-linear), electrical energy and power.

EMF and potential difference, internal resistance of a cell, combination of cells in series and parallel, Kirchhoff's laws and simple applications. Wheatstone bridge and Meter Bridge. Potentiometer-Principle and its applications to measure potential difference and for comparing EMF of two cells; measurement of internal resistance of a cell.

Unit-III Magnetic effect of Current and magnetism: (16 Periods)

1. Moving charges and magnetism:

Concept of magnetic field, Biot-Savart law and its application to find magnetic field on the axis and at the centre of a current carrying circular loop, Ampere's law and its application to infinitely long straight wire. Straight and toroidal solenoid (qualitative treatment only); Force on a moving charge in uniform magnetic and electric fields.

Force on a current carrying conductor in a uniform magnetic field, force between two parallel current carrying conductors- definition of ampere, torque experienced by a current loop in uniform magnetic field, moving coil galvanometer- its current sensitivity and conversion to ammeter and voltmeter.

2. Magnetism and matter:

Current loop as a magnetic dipole and its magnetic dipole moment, magnetic dipole moment of a revolving electron, magnetic field lines, earth's magnetic field and magnetic elements.

Para-, dia- and ferro- magnetic substances with examples.

Unit-IV Electromagnetic induction and Alternating current: (12 Periods)

1. Electromagnetic induction:

Faraday' laws of electromagnetic induction, motional EMF and current induced due to it, Lenz's law, Eddy currents, self and mutual induction.

2. Alternating Current:

Alternating currents, peak and RMS value of alternating current / voltage, reactance and impedance, LC oscillation (qualitative idea only), LCR series circuit (qualitative idea using impedance triangle), resonance, power in AC circuits, wattles current, Transformer (Principle of working & efficiency).

Unit-V Electromagnetic waves: (02 Periods)

Electromagnetic spectrum (radio waves, microwaves, infrared, visible, Ultra violet, X-ray and gamma rays), including elementary ideas about their uses.

Unit-VI Optics (20 Periods)

1. Ray optics and optical instruments:

Refraction of light, refractive index, its relation with velocity of light (formula only) total internal reflection and its applications, Refraction at spherical surfaces, thin lens formula, lens makers formula, magnification, power of lenses, combination of two thin lenses in contact, combination of a lens and a mirror, refraction and dispersion of light through prism.

Optical instruments: microscopes and telescopes (reflecting) and their magnifying powers.

2. Waves Optics:

Wave front, Huygen's principle, Interference, Young's double slit experiment and expression for fringe width, coherent sources, sustained interference of light, diffraction due to a single slit, width of a central maximum, polarization, plane polarized light, Brewster's law.

Unit-VII Dual nature of Radiation and matter: (06 Periods)

Dual nature of radiation, Photoelectric effect, Einstein's photoelectric equation, particle nature of light.

Matter waves- wave nature of particles, de-Broglie relation.

Unit-VIII Atoms and Nuclei (12 Periods)

1. Atoms:

Alpha- particle scattering experiment, Rutherford's model of atom, its limitations, Bohr model, energy levels, hydrogen spectrum.

2. Nuclei:

Atomic nucleus, its composition, size, nuclear mass, nature of nuclear force, mass defect, binding energy per nucleon and its variation with mass number, nuclear fission, fusion, Radioactivity, alpha, beta and gamma particles/ rays and their properties, radioactive decay law, half life and decay constant.

Unit-IX Semiconductor electronics: (12 Periods)

Energy bands in conductors, semiconductors and insulators (qualitative idea only), p-type, n-type semiconductors, semiconductor diode, V-I characteristics in forward and reverse bias, diode as a half and full wave rectifier (centre tap), efficiency (no derivation).

Junction transistor, transistor action, Characteristics of transistor, transistor as an amplifier (CE configuration), basic idea of analog and digital signals, Logic gates (OR, AND, NOT, NAND, and NOR).

Unit-X Communication System: (06 Periods)

Propagation of electromagnetic waves in the atmosphere, sky and space wave propagation, satellite communication, Need for-modulation, qualitative idea about amplitude modulation and frequency modulation, advantages of frequency modulation over amplitude modulation,

***** UNIT WISE MARK DISTRIBUTION (Physics Theory) and QUESTION WISE BREAK UP REMAINS THE SAME AS THEIR IN EARLIER SYLLABUS.***

PRACTICALS

Total Periods 40

Section A

Experiments

1. To determine resistance per cm of a given wire by plotting a graph for potential difference versus current.
2. To find resistance of a given wire using metre bridge and hence determine the resistivity of its material.
3. To verify the laws of combination (series) of resistances using a metre bridge.
4. To verify the laws of combination (parallel) of resistances using a metre bridge.
5. To compare the EMF of two given primary cells using potentiometer.
6. To determine the internal resistance of given primary cell using potentiometer.
7. To determine resistance of a galvanometer by half-deflection method and to find its figure of merit.

Section B

Experiments

1. To find the value of V for different values of *u* in case of a concave mirror and to find the focal length.

2. To find the focal length of a convex mirror, using a convex lens.

3. To find the focal length of a convex lens by plotting graphs between *u* and *v* or between 1/*u* and 1/*v*.

4. To determine angle of minimum deviation for a given prism by plotting a graph between the angle of incidence and the angle of deviation.

5. To determine refractive index of a glass slab using a travelling microscope.

6. To draw the I-V characteristic curve of a P-n junction in forward bias and reverse bias.

7. To draw the characteristic curve of a zener diode and to determine its reverse breakdown voltage.

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Revised syllabus 2020-21

BUILDING MAINTENANCE

FIRST YEAR

PAPER-I THEORY

Mark : 40

Unit - I

1. Stone: Classification, composition, Characteristics, uses, method of quarrying and dressing.
2. Brick: Method of manufacture, classification, testing of bricks.
3. Cement: Classification, grades, quality tests and uses of concrete making materials (coarse aggregate, Fine aggregate, water) Test of cement and concrete (W/C ratio workability, Compressive and tensile strength)

Unit - II

1. Timber, Plywood: Characteristics of suitability for different and allied purpose. Defects and decay, Seasoning and products preservation of Timber.

Unit - III

Deleted

Unit - IV

1. Steel : Characteristics, composition, grades & testing.

BUILDING MAINTENANCE

FIRST YEAR

PAPER- I, PRACTICAL

Mark : 60

Units

Building Drawing

- Types of building, principles of site selection, orientation of building and distribution of space.
- Introduction to Auto Cad, Code provisions in IS 696, Construction of simple geometrical figures & engineering curves, development of surfaces like cubes, cuboids, spheres. Line plan of building, development of plan from line plan, details of doors, windows and staircase.

Field Study of RCC Roof, Brick Work, Foundation Lintel, Stair Case Etc.

- Drawing a simple two room official building, multi-storied residential building plan front and sectional elevation, Building drawing project.

BUILDING SERVICES & INFRASRUCTURAL ENGINEERNG.

FIRST YEAR.

PAPER- II THEORY.

Marks: 40

Unit - I

Surveying : Principles of surveying, classification,chain surveying, leveling principle, reduced level, bench mark, temporary adjustment of leveling, method of booking,

Unit - II.

Road : Classsification of road, carriage way, camber gradient, super elevation , specification of construction of, bituminous & concrete road (brief idea).

Unit - III

Water Supply : Introduction, Types of demand, quality of water, impurities in water, drinking water standard, disinfection of water brief idea).

Sewerage & its treatment : Terminology physical chemical and Bacteriological characteristics, Aerobic and Anaerobic

Unit - IV

House Plumbing Services : Planning, Terminology, water supply pipe and fitting, fixtures and its house hold attributes, wash basin, sink, water closet, Flushing cistern, bath tubs etc. Sewerage construction,

BUILDING MAINTENANCE
FIRST YEAR
PAPER-II PRACTICAL

Marks : 60

Units

(i) **Testing of Cement and Concrete:** Basic test for cement and concrete: Fineness, soundness, setting time, compressive, strength, heat of hydration, cube test, mix design of concrete of different grades.

(ii) **Testing of water samples**:

a. Determination of pH.

b. Determination of turbidity by using Nephelometer.

(iii) **Surveying & field work :**

a. Chain triangulation of a given area.

b. Plotting the chain triangulation.

c. Study of Dumpy level and Auto level.

d. Longitudinal sectioning and cross sectioning –Contouring.

(iv) **Layout plan of Building in field** :

a. Setting the boundary of building as per the plan.

ANALYSIS, DESIGN & DETAILING OF STRUCTURES

SECOND YEAR

PAPER- III (Theory)

Marks: 40

Unit - I

Shear Force and Bending, Moment Slope & Deflection : Definition, types of support, shear force and bending, moment diagram for the structures. Inter-relations between shear force and Bending Moment.

Unit - II

Properties of concrete. Basic idea on compressive of concrete strength, tensile strength, shrinking, creeps, Grade of concrete, Reinforcing steel, its type and grade, basic concept on concrete design, limit state of safety and serviceability, single and double reinforced concrete

Unit - III

Reinforcement : Reinforcement detailing for structure elements and detailing of their joints.

Unit - IV

Painting : Types of paint (all types of paint i.e. cement paint varnishes enamel paint distemper etc.) composition, primer characteristics, method of application of adhesive.

ANALYSIS, DESIGN & DETAILING OF STRUCTURES.

SECOND YEAR.

PAPER- III PRACTICAL.

Marks : 60

Units

1. Structural design practice:
    a. Design & Detailing of beams.
    b. Design & Detailing of slabs.

2. Application of Painting : Survey and Collection of data

ESTIMATION & SAFETY OF BUILDINGS

SECOND YEAR.

PAPER- IV THEORY

Marks : 40

Unit - I

Construction Planning : Introduction, types of estimation, principles of estimation, various item of work in building work road, short wall and long wall method, centre line method, rate analysis for different item and lead statement.

Unit - II

Estimation : Estimation of quantities for building, details of specification for different building items, analysis of rates, analysis of rates for earthwork, cement concrete, RCC, brick work, plastering etc. and work contract.

Unit - III

Environment Engineering : Nature & Scope of environment problems. Eco system effects,

Unit - IV

Deleted

ESTIMATION & SAFETY OF BUILDINGS

SECOND YEAR

PAPER- IV PRACTICAL

Marks : 60

Units

1. Preparation of estimate for a building.
2. Preparation of schedule of activities by CPM & Bar Chart.
3. Demonstration of fire fighting techniques.

COMPUTER TECHNIQUE
FIRST YEAR
PAPER- I (THEORY)
COMPUTER FUNDAMENTALS

Marks : 40

Unit - I

Introduction to computer: History of computer, Evolution of computer, Generation of computer, components of computer system, Different Input/output devices i.e. mouse, keyboard, monitor, printers, Machine language, Assembly language and High level language.

Unit – II

Introduction to Numbers system: Binary, octal, Decimal, hexadecimal, addition, subtraction and its conversion. Computer codes (1'S, 2'S) complements and ASCII codes)

Unit – III

Logic gates and Truth Tables: AND, OR, NOT, XOR, NAND, NOR, logical expression using NAND and NOR gates

Unit – IV

Memory: Main memory-RAM and its types, cache-memory. Secondary memory: Hard disk, floppy disk, Compact disk

FIRST YEAR
PAPER-I (PRACTICAL)
OFFICE AUTOMATION

Marks : 60

MS-Windows Working with Window
MS-WORD Starting MS-Word, Creating and operating, Saving a document, Editing Text, formatting documents: Line spacing, paragraph Spacing, Setting tabs, Indenting text, Aligning text, Adding Proofing a document, mail merge.

MS-Powerpoint Starting power point, Operating and existing presentation, Creating, Closing and Saving a presentation. Existing Power Point Using master - Slide, Title, Handout, Notes

MS-Excel Introducing starting MS-EXCEL, Opening of Worksheet, Saving a Worksheet, and Spreadsheet operation: Entering Numbers, Text, Dates and Times Formulas Editing Worksheet: Deleting cells, Rows, Columns, Inserting cells, Rows and columns, Printing a Worksheet.

Formatting Text Changing text Attribute Styles, Changing Bullet, Characteristic aligning, Line setting, Paragraph Setting, Drawing object like lines, Arcs, Rectangles, Ellipse, Drawing Free from shapes, Using Auto shape, Rotating objects, Modifying colours and lines. Adding header and footer, inserting MS-Word tables or MS-EXCEL Worksheet, Printing presentation component
.

Formulas and Functions

Absolute and relative Reference of cell, Entering a formulas, Mixed Entering Function, Calculation using functions Different type of functions in EXCEL, charts: Creating Editing, Inserting, Deleting, Saving, Printing

DESKTOP PUBLISHING (DTP)
Concept of DTP Introduction to DTP - What is Desktop Publishing? Uses of DTP and print Documents, Uses of fonts, Frames, page layout, etc. Advantages of DTP over Word processing. Document Planning: Page layout, Margin, Header and Footer, Fonts Styling

Desktop Publishing using
PageMaker Page make and minimum configuration require for installation use of file, edit, page frame, font, graphic and option menus, creation of style sheet: preparation of tables of contents, index, usages of width table, add or remove fonts, command for printing.

Corel Draw Installation of Corel draw and minimum configuration, requirements, Surfing through opening interface for all tools and menus, working with texts, edit special effects, fonts and choosing artistic and paragraph text.

FIRST YEAR
PAPER II (THEORY)
C- PROGRAMMING

Marks : 40

Unit- I

Introduction to programming: History of C, structure of C
C language fundamental: character set, key word, identifier, data types, constant, variables, input/ output statements, declaration and initialization statements, structure of C program, simple program in C.

Unit – II

Operators and expression: assignment, arithmetic, module, increment and decrement, logical, relational, bitwise and conditional operators

Unit – III

Decision making and looping: switch case, if, if-else, if-else-if, while, do-while, for loop, break, simple program using control statement.

Unit – IV

Arrays: Declaration, memory representation of array, one-dimensional array, multidimensional array
Function and its use: introduction to function, categories of function, function prototype, function call (call by value) program using function, Recursion

FIRST YEAR
PAPER – II (PRACTICAL)
C- PROGRAMMING

Marks : 60

Units

1. Write a program to find the sum and average of two numbers.
2. Write a program for swapping two variables without using third variable.
3. Write a program to calculate simple Interest and Compound Interest.
4. Write a program to convert temperature entered into centigrade to Fahrenheit.
6. Write a program to read in a three digit number produce following output (assuming that the input is 539) 5 hundreds 3 tens 9 units
8. Write a program to find student grade using IF-ELSE ladder
10. Write a program for simple calculator using switch/case loop.
11. Write a program for print Fibonacci series up to N number.
12. Write a program to find sum of first 50 odd numbers and even numbers.
13. Write a program to find reverse of given number.
14. Write a program to find factorial of accepted number.
16. Write a program to print the prime numbers between 100.
17. Display the following output on the screen

a.
```
1 1 1 1
2 2 2 2
3 3 3 3
4 4 4 4
```

b.
```
*
**
***
****
*****
```

c.
```
1
1 2 1
1 2 3 2 1
1 2 3 4 3 2 1
```

18. Write a program to find minimum, maximum, sum and average of given one dimensional array.
19. Write a program to find addition, subtraction, multiplication of matrix.

SECOND YEAR
PAPER - III (THEORY)
DATABASE MANAGEMENT SYSTEM

Marks : 40

Unit – I

Data processing concept and file structure: Definition, field, record, and files. File organization: Sequential file, direct file, index sequential files

Unit – II

Architecture of database system: Database concept, view/schema, logical, conceptual and their relations, DDL, DML, database manager, advantage and limitation of database system

Unit – III

Data Models: Data Models (Hierarchical, Network, Relational data model, Object oriented data model, Entity-Relationship data model), ER-diagram

Unit – IV

Query Language: Different types of key, Defining database in SQL, Inserting, Updating and Deleting data, Processing single tables, Processing multiple tables.

SECOND YEAR
PAPER - III (PRACTICAL)
DATABASE

Marks : 60

Unit – I

Writing Basic SQL SELECT Statements

Basic SELECT Statement, Selecting All Columns, Selecting Specific Columns, Writing SQL Statements, Column Heading Defaults, Arithmetic Expressions, Using Arithmetic Operators, Operator Precedence, Using Parentheses, Defining a Null Value, Null Values in Arithmetic, Expressions, Defining a Column Alias, Using Column Aliases, Concatenation Operator, Using the Concatenation Operator, Literal Character Strings, Using Literal Character Strings, Duplicate Rows, Eliminating Duplicate Rows,

Unit – II

Restricting and Sorting Data

Limiting Rows Using a Selection, Limiting the Rows Selected, Using the WHERE Clause, Character Strings and Dates, Comparison Conditions, the BETWEEN Condition, Using the IN Condition, Using the LIKE Condition, Using the NULL Conditions, Logical Conditions, Using the AND Operator, Using the OR Operator Using the NOT Operator, Rules of Precedence, ORDER BY Clause, Sorting in Descending Order, Sorting by Column Alias, Sorting by Multiple Columns.

Unit – III

Single-Row Functions

SQL Function, Two Types of SQL Functions, Single-Row Functions, Character Functions, Case Manipulation Functions, Using Case Manipulation Functions, Number Functions, Using the ROUND Function, Using the MOD Function, Working with Dates, Arithmetic with Dates, Using Arithmetic Operators with Dates, Using Date Functions.

Unit – IV

Displaying Data from Multiple Tables

Obtaining Data from Multiple Tables, Generating a Cartesian Product, Types of Joins, Joining Tables Using Oracle Syntax, Retrieving Records with Equijoins, Joining More than Two Tables, Non-Equijoins, Joins Outer Joins LEFT OUTER JOIN, RIGHT OUTER JOIN, FULL OUTER JOIN

Unit – V

Aggregating Data Using Group Functions
What Are Group Functions?, Types of Group Functions, Group Functions Syntax, Using the AVG and SUM Functions, Using the MIN and MAX Functions, Using the COUNT Function, Creating Groups of Data, Using the GROUP BY Clause, Using the GROUP BY Clause on Multiple Columns, Illegal Queries Using Group Functions, Excluding Group Results, Using the HAVING Clause, Nesting Group Functions.

Unit – VI

Manipulating Data
Data Manipulation Language, Adding a New Row to a Table, The INSERT Statement, Inserting New Rows, Inserting Rows with Null Values, Inserting Special Values, Inserting Specific Date Values, Copying Rows from Another Table, Changing Data in a Table, The UPDATE Statement Syntax, Updating Rows in a Table, Updating Two Columns with a Subquery, Removing a Row from a Table, The DELETE Statement, Deleting

Unit – VII

Creating and Managing Tables
The CREATE TABLE Statement, Referencing Another User's Tables, The DEFAULT Option, Creating Tables, Tables in the Oracle Database, Data Types.

Unit – VIII

Including Constraints
Defining Constraints, NOT NULL Constraint, UNIQUE Constraint, PRIMARY KEY Constraint, FOREIGN KEY Constraint, CHECK Constraint, Adding a Constraint Syntax, Adding a Constraint.

SECOND YEAR
PAPER IV (THEORY)
COMPUTER NETWORK

Marks ; 40

Unit – I

Introduction to computer Networks: Data communication components. What is computer network, uses and application of networks, Types of networks: LAN, MAN, WAN, satellite network.

Unit – II

Transmission Terminology: Transmission Mode (simplex, half duplex, full duplex), digital and analog data, transmission media and its characteristics, twisted pair wire, co-axial cables, optical fibers networks. Network devices: Hub, switch, router, bridge, multiplexer, de-multiplexer, modem, Network topology.

Unit – III

Introduction to Internet: History, Services, applications and architecture of Internet, WWW, Websites, Web Pages, Search Engine, E-mail, FTP, Web browsers, Google Chrome, Mozilla Firefox and Microsoft Internet explorer.
Introduction to HTML: Creation of web page.

Unit – IV

Network Safety Concern: Cyber security, Virus, Worm, Trojan, Anti-Virus, Social networking and safe practices on social networks.
Web-based application: E-Commerce, E-Governance, OLAP

SECOND YEAR
PAPER- IV (PRACTICAL)
NETWORKING

Marks : 60

Units

1. Study of Hardware Component used in Networking.
2. Crimping of UTP Cable, Patch Panel Punching, Junction I/O Boxes.
3. Installation of Network Interface Card (NIC).
4. Peer-to-Peer Networking & Working in Peer-to-Peer Environment.
6. Troubleshooting (Cable Connectivity, Upgrading NIC Driver Software).
7. Installation of Wireless Devices -LAN Card, Router, Access Point.
8. Identifying valid IP Addresses, Defining Subnet Ids and Host Ids.
10. Study of TCP/IP Configuration Settings on Windows XP System

Revised Syllabus 2020-21

CROP PRODUCTION

FIRST YEAR

PAPER-1 (THEORY)

(Weekly Two Periods, Total- 68 Periods per year)

Full Marks-40

Unit - I

ELEMENTARY AGRONOMY

Weather and Climate: Elements of weather and climate, factors of climate, crop weather relationship.

Cropping system, classification of crops, mono-cropping, multiple cropping, crop rotation, mixed cropping, inter cropping and relay cropping. Cropping intensity, cropping scheme, calendar of operation.

Unit - II

Tillage: Types of tillage, objectives of tillage, tillage implements, ploughs, cultivators,harrows, seed drill, seed-cum-fertilizer drill, inter culture, harvesting and threshing implements.

Seeds: Characteristics of good seed, types of seed, seed viability, moisturegermination and purity testing.

Unit - III

Water Management: Importance of irrigation and drainage, factors affecting-irrigation requirements, methods of irrigation and irrigation appliances.

Unit - IV

Weed Control: Definition and classification of weeds, principles and methods ofweed control, mechanical and chemical methods of weed control.

CROP PRODUCTION
FIRST YEAR
PAPER-1 (PRACTICAL)
(Weekly Two Classes, Total-68 classes per year)

Full Marks-60

Unit - I

Identification and use of meteorological equipments, preparation of temperature, rainfall and humidity maps of Odisha.

Preparation of cropping scheme, cropping pattern, crop-rotation and calendar of operation of different crops.

Unit - II

Identification and study of primary, secondary and inter-tillage implements in the field.

Identification of crop plants and their seeds and seed treatment. Germination and purity test of seeds.

Unit - III

Lay-out of different methods of irrigation.

Unit - IV

Identification of weeds associated with upland, medium land and low land crops. Mechanical and chemical method of weed control.

CROP PRODUCTION
FIRST YEAR
PAPER - II (THEORY)
(Weekly Two periods, Total-68 periods per year)

Full Marks-40

Unit - I

Soil and its properties: Soil a medium of plant growth, soil profile, volume composition of soil- four major components, soil-organic matter and its properties, soil micro-organisms and its role in soli. Soil physical properties, soil texture, soil structure, soil PH and availability of nutrients to plants.

Unit - II

Concept of soil fertility and productivity: Essential elements: Macro & micro nutrients, their role in plants and deficiency symptoms: sources of their availability and utilization for crop production. Soil testing as a tool to assess soil fertility.

Unit - III

Manures, Fertilizers:- Bulky organic manures: FYM, Compost, Green manures,Bio-fertilizers, Concentrated organic manures:- Oil cakes, their nutrient content and uses.

Chemical fertilizers: Straight and complex fertilizer, mixed fertilizer, their nutrientcontent. Principles of Fertilizer Application, quantity, time and method of fertilizer application.

Unit - IV

Soil amendments and their application.

CROP PRODUCTION
FIRST YEAR
PAPER-II (PRACTICAL)
(Weekly Two Classes, Total-68 Classes per year)

Full Marks-60

Unit - I

Study of soil profile in the field, study of soil physical properties, determination of texture, structure, bulk density and pore space.

Unit - II

Study of deficiency symptoms of nutrients in the fields. Computations of doses of fertilizer for different crops from soil test value.

Unit - III

Identification of fertilizers, bio-fertilizers and their application. Methods of fertilizer application, preparation of FYM and compost, seed inoculation with Rhizobium culture.

Unit - IV

Identification and computation of dose of soil amendment. Determination of lime requirement of soil.

CROP PRODUCTION
SECOND YEAR
PAPER-III (THEORY)
(Weekly Two Periods, Total-68 Periods per year)

Full Marks-40

Unit - I

Distribution, Climate/Season, Soil, variety, Seed treatment, Seedbed Preparation, Time and method of sowing, Nursery management, Seedrate, Spacing, Manure and fertilizer application, Interculture and weed control, Irregation, Plant protection, Harvesting and threshing, Storage and economic of production of the following crops:

Cereals and Millets: Rice, Wheat, Maize, Ragi

Pulses: Greengram, Blackgram, Arhar, Horsegram

Oil seeds: Groundnut, Rapeseed and Mustard, Sesamum, Sunflower.

Unit - II

Fibre Crops: Jute, Cotton

Sugar Crops: Sugar cane

Unit - III

Plantation Crop: Coconut.

Unit - IV

Fruit Crops: Mango, Banana, Citrus, Guava, Pineapple, Papaya

Vegetable Crops: Brinjal, Tamato, Potato, Aokra, Cucurbits, Onion.

CROP PRODUCTION
SECON YEAR
PAPER-lll (PRACTICAL)
(Weekly Two Classes, Total-68 Classes per year)

Full Marks-60

Units

Identification of varieties and seeds. Preparation of nursery and seedbed, seed treatment and sowing of seed by different methods. Transplanting of Paddy and Ragi.

Inter cultural operations, weeding and use of herbicides.

Preparation of cotton seed for sowing. Treatment of sugarcane sets before sowing/planting. Identification of different fruit crops vegetable crops, plantation crops, varieties, seeds and garden implements.

Calculation of seed rate of different crops. Manuring and other cultural operation.

CROP PRODUCTION
SECOND YEAR
PAPER- IV (THEORY)
(Weekly Two Periods, Total-68 Periods per year)

Full Marks-40

Unit - I

Plant Protection: Importance of Plant Protection in Agriculture. Integrated insectpest and disease control, Mechanical, Cultural, Chemical and control measures.

Unit - II

Common Plant Protection Chemicals .Insecticides and fungicides.Methods of use and safe handling. Plant protection equipments, their use and maintenance.

Unit - III

Important insect pests and diseases of different crops (Rice, Wheat, Maize, Blackgram, Greengram, Arhar, Groundnut, Mustard, Sugarcane.

Unit - IV

Mushroom cultivation for domestic and commercial purposes.

CROP PRODUCTION

SECON YEAR
PAPER-IV (PRACTICAL)
(Weekly Two Classes, Total-68 Classes per year)

Full Marks : 60

Unit - I

Identification and collection of insect pests of field crops, cereals, pulses, oil seeds, sugarcane, vegetables, jute, cotton and store grain pests.

Unit - II

Study of different insecticides, preparation of spray solutions. Identification of diseased plant parts.

Unit - III

Identification of different types of plant protection equipments, their parts, function and use in the field.

Unit - IV

Preparation of mushroom beds and maintenance.

DAIRYING (DAI)
FIRST YEAR
PAPER – I (Theory)

Marks : 40

Unit - I	Introduction to Dairying	Dairying – introduction. History & Present status of dairy farm producers in India & Odisha.
Unit - II	Dairy farming Basics	Setting up a Dairy farm – aspects to consider, farmer's eligibility & critical needs. Opportunities, shortcomings & challenges. Making up entrepreneurial deficiencies.
Unit - III	Morphology & Breed characteristics of cattle & buffalo	Broad idea on Cattle & buffalo morphology, productive traits, behavior & Habitat – under domestication. Recognised Cattle & Buffalo breeds of India, Odisha & Exotic donor breeds used. Outlines on salient characteristics & productivity, milk yield & quality.
Unit - IV	Stocking of animals, herd improvement and maintenance	Principles of genetical improvement of breeds. Systems of breeding. Maintenance of blood level. Selection & culling based on records & judging. Procurement of Dairy animals, Soundness certification, legal requisites and insurance cover. Mode of Transport, Care during transportation & post procurement.

DAIRYING (DAI)
FIRST YEAR
PAPER – I (Practical)

Marks: 60

Units (iii)	Identification with salient traits of important breeds of Indian Dairy, draft & dual cattle, Exotic donor breeds, Buffalo breeds.
(iv)	Common terms used in Dairy Farming & cattle markets.
(vi)	Study of dairy wedges.
(vii)	Preparation & use of score card for judging of milch cow.
(viii)	Restraint, leading & handling of Cattle & buffaloes
(ix)	Determination of age basing dentition.
(x)	Ear Tagging & branding of animals.
(xii)	Study & filling up of cattle insurance proposal form.
(xiii)	Enlisting of Mandatory requirements for animal transport.

DAIRYING (DAI)
FIRST YEAR
PAPER – II (Theory)

Marks : 40

Unit - I	Housing of Dairy Animals - Ideal environment of well being of live stock	Site for dairy farm – considering available resources, legal, economic & other factors. Systems of cattle rearing – Suitability Dairy housing for different systems.
Unit - II	Hygiene, Sanitation & Waste Management in dairy farms	Hygiene, sanitation, safety in dairy farms. Construction of structures, use of space & money saving techniques Fittings & fixtures for accommodation, Tools & equipments – their maintenance & storage. Waste & carcass management. .
Unit - III	Forage Production - I	Importance of Forage; Status of pastures, grass lands & forage cultivation in Odisha & India. Challenges to fodder production in Odisha Fodder crops : selection. Tillage of soil and cultivation practices for cereals, legumes & grasses. Application of manure, fertilizers, pesticides – merits & demerits. Crop rotation, inter cropping & cropping schemes.
Unit - IV	Forage Production - II	Stages of harvest of different fodder crops. Loss minimization tips. Preservation of green fodder. Use of grass, fodder & lopped leaves as green forage. Merits of chaffing & diet dosing of green fodder.

DAIRYING (DAI)
FIRST YEAR
PAPER – II (Practical)

Marks: 60

Units (i)	Floor space requirements for different age & stage of dairy animals.
(ii)	Preparation of Design for a Dairy farm.
(iii)	List of tools & equipments used in a milch cow byre.
(iv)	Dairy farm – waste disposal designs.
(v)	Study of a Biogas plant, Composition & utility of Biogas.
(viii)	Identification of Fodder & their seeds / stumps.
(x)	Study of a chaff cutter.

DAIRYING (DAI)
SECOND YEAR
PAPER –III (Theory)

Marks : 40

Unit - I	Feeds & feeding of Dairy animals	Digestive system of adult ruminants & calves. Physiology of Digestion, absorption & utilization. Classification of feeds. Concentrates, Roughages, Feed supplements & additives and water – their role & nutritional values. Importance of good quality of feed & water. Ration requirement for maintenance & production stages. DCP & TDN – Formulation principle for mixed concentrates.
Unit - II	Feeding practices & value addition of feed	Feeding of dairy animals at different age and stages. Anti-nutritive factors and adulterants in common feedstuff – combating maneuvers.
Unit - III	Care & Management of Dairy cattle	Care of Dairy animals. Factors contributing to wellbeing of animals. Providing Basic needs like Balanced diet, Clean water, comfortable ambience & Fresh air & exercise etc. – common to all categories. Special attention to different categories of animals. Routine & casual attention in dairy farm.
Unit - IV	Diseases of cattle & buffalo and their prevention & control	Out lines on infectious and metabolic diseases of cattle & Buffalo. Concept on Prevention & control of Diseases in farm animals. Immunity system & vaccines & its effect. Prevention of calf mortality, Abortions & mastitis. Control & eradication of Parasitic diseases.

DAIRYING (DAI)
SECOND YEAR
PAPER – III (Practical)

Marks: 60

Units (i)	Identification of feed stuff with TDN & DCP values for cattle.
(iii)	Computation of ration with locally available feed stuff.
(iv)	Recognition of inedibility in feedstuff by organoleptic test
(v)	BIS standard for cattle feeds of diff categories.
(viii)	Formulation of concentrate mix using Pearson's square.
(ix)	Preparation of hand mixed feed concentrate at farm.
(x)	Preparation of Artificial colostrums & calf starter.

DAIRYING (DAI)
SECOND YEAR
PAPER – IV (Theory)

Marks : 40

Unit - I	Reproduction in Dairy Cattle	Broad idea on Anatomy & physiology of reproductive system in cattle & buffaloes. Oestrus symptoms & detection. Choice of semen &Timing of AI. Pregnancy diagnosis & special care of Pregnant animals and under development regimes. AI techniques, Idea on Frozen semen straw production, handling, transport & storage. Infertility and other breeding failures in the farm. Causes & remedial steps. Parturition – Symptoms and Mechanism. Dystokia & ROP etc. problems and points to intervene.
Unit - II	Milk Production	Methods of milking and precaution. Factors affecting quality and quantity of milk production Clean milk production. Quality Improvement & Values addition of milk.
Unit - III	Dairy entrepreneurship	Importance of economic viability in a dairy enterprise. General principles of accounts keeping.
Unit - IV	Organised Milk Marketing and extension	Structure & functions of organized Dairy Cooperative setups in Odisha – organization and function of OMFED. Pollution control, SPCA, Consumer protection, cattle tress pass, Prevailing Milk & Milk product Laws. Cattle and Micro-insurance schemes. Labor laws & zoonosis. Provident Fund and other welfare benefit options available to employees.

DAIRYING (DAI)
SECOND YEAR
PAPER – IV (Practical)

Marks: 60

Units (ii)	Steps to combat stress to farm animals in hot humid weather.
(v)	Study of Process of Weaning, Drying off
(vi)	Familiarizing with Maintenance of different records.
(vii)	Sample Routine of Daily & Casual works.
(viii)	Observing Vaccination of animals & study of Vaccine calendar.
(ix)	Administration of medications – drenching, spray etc.
(x)	Performing Castration (closed), dehorning, hoof trimming.
(xi)	Enlisting First – aid steps of animals in emergencies.
(xii)	Observing parenteral administration of drugs to animals.
(xiii)	Practice of drain of abscess, wound dressing & bandaging.

Revised Syllabus 2020-21
ELECTRICAL DOMESTIC APPLIANCES (EDA)
FIRST YEAR
THEORY PAPER - I

Marks: 40

UNIT- I

Current Electricity **(4)**

Electricity as a source of energy, Definition of Resistance, Voltage, Current, Power, Energy and their units, Relation between electrical, mechanical and thermal units, Factors affecting resistance of a conductor, Temperature co-efficient of resistance, Difference between AC and DC voltage and current.

D.C. Circuit **(5)**

Ohm's Law, Series - parallel resistance circuits, Calculation of equivalent resistance, Kirchhoff's Laws and their applications.

UNIT- II

Capacitor **()**

Capacitor and its capacity, Concept of charging and discharging of capacitors, Types of Capacitors and their use in circuits, Series and parallel connection of capacitors, Energy stored in a capacitor.

Heating and Lighting (Illumination) Effects of Current **(5)**

Joule's Law of electric heating and its domestic applications, Heating efficiency, Lighting effect of electric current, Filaments used in lamps and gaseous discharge lamps, their working and applications.

UNIT-III

Electromagnetic Effects: **(7)**

Permanent magnets and Electromagnets, their construction and use, Polarities of an electromagnet and rules for finding them, Faraday's Laws of Electromagnetic Induction, Dynamically induced e.m.f., its magnitude and induction, Static induction, self-induced e.m.f., its magnitude and direction, Inductance and its unit. Mutually induced e.m.f., its magnitude and direction, Energy stored in an inductor, Force acting on a current carrying conductor in magnetic field, its magnitude and direction, Torque produced on a current carrying coil in a magnetic field.

UNIT-IV

A.C Circuits **(9)**

Generation of a.c. voltage, its generation and wave shape. Cycle, Frequency, Peak value (maximum value), Average value, Instantaneous value, R.m.s. value, Form factor, Crest factor, Phase, Phase difference, Power and power factor, A.C. Series Circuits with (i) resistance and inductance (ii) resistance and capacitance and (iii) resistance inductance and capacitance, Q factor of R.L.C. series circuits.

PRACTICAL PAPER-I

Marks: 60

1. Verification of Ohm's Law.
2. Study of series resistive circuits.
3. Study of parallel resistive circuits.
4. Study of series and parallel connection of cells in circuits.
5. Charging and discharging of a capacitor.
6. Verification of Faraday's Laws of electromagnetic induction.
7. Verification of torque development in a current carrying coil in magnetic field.
8. Study of R.L. series circuit and measurement of power and power factor.
9. Study of R.C. series circuit and measurement of power and power factor.
10. Study of R.L.C. series circuit and measurement of power and power factor.
11. Connection of fluorescent tube-light circuit.
12. Test and repair of (i) table lamp (ii) fluorescent tube-light.

THEORY PAPER - II

Marks: 40

UNIT- I

Dimensioning Techniques **(4)**

Necessity of techniques, methods holes, irregular figures, scales and principles, dimensioning of chamfered portions, hatched figures, countersunk.

Sections **(4)**

Importance, methods of representing, conventional sections of various materials, classification of sections, conventions.

UNIT-II

Electrical Engineering Drawing **(4)**

Schematic and wiring diagram for domestic simple wiring, symbols used for different electrical devices and equipments.

UNIT-III

Insulating Materials **()**

What is insulating materials ?, Insulation resistance, Di-electric strength, Breakdown voltage, Classification of insulating materials on the basis of operating temperature, PVC, Porcelain, Mica, Bakelite, Asbestos, Transformer oil, Air as insulating materials, their properties and uses.

Soldering and Brazing **(4)**

General characteristics of soldering, brazing joints, processes and their characteristics, Brief description of soldering and brazing tools equipment, Types of solders and fluxes and their uses, Soldering defects and their remedies, Brazing materials, Advantages and disadvantages of soldering and brazing.

UNIT-IV

Electrical Accessories

Common electrical accessories, their specifications, Explanation of switches, lamp holders, plugs and sockets. Developments of domestic circuits. Alarm and switches, with individual switches, Two way switch. Security surveillance, Fire alarm, MCB, MCCB, ELCB and fuses.

Electrical Wiring (Domestic & Industrial) **(4)**

Types of domestic wiring- Cleat wiring, casing and capping, C.T .S. / T.R.S. wiring, metal sheath wiring. conduit wiring and concealed wiring - their procedure, Factors of selection of a particular wiring system, Importance of switch, fuse and earthing of wiring system, types of faults, their causes and remedies.

PRACTICAL PAPER-II

Marks: 60

1. Measurement of resistance by ammeter and voltmeter method and Ohm meter.
2. Identification of insulating materials.
3. Controlling lamps in series, parallel and series parallel.
4. Controlling lamp from two or three places (Stair case wiring and godown wiring).
5. Drawing schematic diagram to give supply to consumers.
6. Practice on casing and capping wiring.
7. Practice on cleat wiring.
8. Practice on CTS / TRS wiring.
9. Practice on conduit wiring.
10. Practice on concealed wiring.
11. Measurement of insulation resistance of wiring installation by megger.
12. Testing of wiring installation.
13. Installation of pipe earthing for wiring installation.
14. Installation of plate earthing for wiring installation.
15. To prepare series test board.
16. Fixing of switches, holder, plugs etc. In PVC & NANO board.
17. Measurement of earth resistance by earth tester.
18. To fit MCB in a circuit in place of fuse.

SECOND YEAR
THEORY PAPER - III

Marks: 40

UNIT- I

Single phase Transformer **(8)**

Working principles and construction, Components, Auxiliary parts i.e. breather, conservator. buchholze relay, other protective devices. Types of transformer – step-up and step-down transformer, voltage and current transformer, auto- transformer. Applications of different types of transformers.

UNIT-II

D.C. Machines **(12)**

Types of motor - series, shunt, compound and universal, construction, working principles, characteristics, winding details and applications of different types of motors including fractional horse power, starting and starters for D.C Motors.

Installation of D.C motor and testing, speed reversal and speed control of D.C. motors, Common faults, their causes, testing and repairs.

UNIT-III

Common Hand Tools **(4)**

Familiarizing the students with common hand tools, safe and proper use of tools, their adjustment and applications, crimping and crimping tools.

UNIT- IV

Single Phase A.C. Motors **(12)**

Types of A.C Motors - induction motor (Split phase and repulsion start), Capacitor motor, shaded pole motor, universal motor, construction, working principles, special characteristics, winding details and applications of different types of fractional horse power motors. Speed reversal and speed control of A.C Motors, Installation of A.C motor and testing, common faults, their causes, testing and repairs.

PRACTICAL PAPER - III

Marks: 60

1. Dismantling, study and reassembling of a D.C motor.
2. Measurement of resistance of series, shunt field and armature of a given D.C. motor and identification of terminals by multi-meter.
3. Measurement of insulation resistance of armature and field.
4. Testing, fault finding and repair of a d.c. motor.
5. Overhauling of a d.c. motor.
6. To study d.c. series motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
7. To study d.c. shunt motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
8. To study d.c. compound motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
9. To study d.c. universal motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
10. Identification of common hand Tools.
11. Study of (i) Voltage transformer, (ii) Current Transformer and (iii) Auto-Transformer.
12. Overhauling of an AC motor.
13. Connecting, starting, running of a shaded pole motor.
14. Connecting, starting, running and reversing of a capacitor start/run motor.
15. Connecting, starting, running and reversing of an AC Universal motor.
16. Installation of D.C motor.
17. Installation of AC motor.

THEORY PAPER - IV

Marks: 40

UNIT- I

Electric room heater **(2)**

Construction and working principle of reflector type room heater, common defects, testing and repairs.

Electric iron **(2)**

Types of electric iron - ordinary type and automatic/thermostat control type - construction and working principles of electric irons. Common defects testing and repairs.

Electric toaster **(3)**

Types of toasters - ordinary and automatic. Construction and application of Bimetallic Relay and Thermocouples for control of temperature and current.

UNIT-II

Immersion heater and geyser **(2)**

Construction, working principle and use of immersion heater. Common faults - their causes, testing and repairs. Construction, working principles and use of geyser and thermostat, common defects, their causes, testing and repairs. Testing and installation of geyser. Precautions in using immersion heater and geyser.

Electric fans **(2)**

Types of fans - ceiling fan, pedestal fan, table fan, bracket fan, exhaust fan, construction, working principles. Characteristics and applications of electric fans. Common faults, their causes testing and repairs, installation of all purpose fan and exhaust fan.

Electric Mixer, grinder and blender **(3)**

Construction, working principles, characteristics and applications of electric mixer, grinder and blender. Common faults, their causes, testing and repairs, Servicing, maintenance and over.

UNIT- III

Hair dryer/curler **(2)**

Construction and working principles of hair dryer/curler, Common faults, their causes testing and repair.

Electric Bell **()**

Calling bell, buzzer, alarms, their Construction, Common faults, testing and repair.

Electric washing machine **(2)**

Construction, working principle of ordinary, semi-automatic & fully automatic, special features and applications of washing machine, Common faults, their causes, testing and repair, Repairing, servicing, maintenance and overhauling of washing machine.

Room Cooler **(2)**

Construction and working details of room cooler, desert cooler, Common cooler faults, their causes, testing and repair, Installation of room cooler/desert cooler.

UNIT-IV

Basic Occupational and safety Practices: **(2)**

Safety signs, lighting and handling loads, moving heavy equipments, Electrical safety- safety practices- first aid, Practice safe methods- lifting and handling of heavy objects, Rescue a person from live wire, Artificial respiration - Nelson's arm and Schafer's Method. Hazard identification and avoidance, use of fire extinguishers.

PRACTICAL PAPER - IV

Marks: 60

1. Dismantling reassembling of reflector type room heater.
2. Testing and repair of reflector type room heater.
3. Dismantling and reassembling of electric iron (i) Ordinary type and (ii) Automatic thermostat control type.
4. Testing and repair of electric iron (i) ordinary type and (ii) automatic/thermostat control type.
5. Testing and repair of electric toaster: (i) Ordinary, (ii) semi automatic, (iii) automatic.
6. Dismantling and reassembling of geyser: (i) instant, (ii) storage.
7. Testing and repair of geyser: (i) storage, (ii) instant.
8. Testing and repair of: (i) electric bell, (ii) buzzer, and (iii) door chime.
9. To connect fan regulator with a ceiling fan.
10. Identification of faults of wiring, installation and rectification.
11. Testing, fault finding, repair and overhauling of blower type room heater and heat connector.
12. Testing, fault finding, repair and overhauling of electrical fans.
13. Testing, fault finding, repair and overhauling (i) electric mixer, (ii) grinder, and (iii) blender.
14. Testing, fault finding, repair and overhauling of washing machine.
15. Testing, fault finding, repair and overhauling of Hair Dryer.
16. Testing, fault finding, repair and overhauling of room cooler/desert cooler.
17. Testing, fault finding, repair and overhauling of vacuum cleaner.
18. Artificial respiration and shock treatment.
19. Technique of removing persons in contact with live wire suffering from electric shock.
20. To test the given fan with the help of Megger insulation resistance tester for: (i) Insulation resistance between body of the fan and winding. (ii) Continuity of windings - starting and running.

Revised syllabus 2020-21
COMPULSORY ENGLISH

(For +2 Vocational Course in Arts, Science & Commerce)

(2016 ADMISSION BATCH)

Full Mark : 50

First Year

Unit-I : Prose **(3x5=15 Marks)**

i.	Standing Up for Yourself	Yevgeny Yevtushenko
ii.	The Legend behind a Legend	Hariharan Balakrishnan
iii.		.

Unit-II : Poetry **(3x5=15 Marks)**

i.	Stopping by Woods on a Snowy Evening	Robert Frost Robert Southey
ii.	The Inchcape Rock	

Unit-III :

(B) Writing Personal Letters and Notes **(10 Marks)**

I. Writing Applications, Official Letters and Business letters

II. Writing Telegrams, E-mails, Personal Advertisements, and Short Notices

(C) GRAMMAR **(10 Marks)**

I. Countable and Uncountable Nouns

II. Tense Patterns

III. Modal Verbs

IV. Prepositions

V. The Imperatives

Book Prescribed : Invitation to English - 1, 2, 3 & 4, Published by Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar.

ENGLISH

SECOND YEAR

Full Marks : 50

Unit-I : Prose **(3x5=15 Marks)**

I. On Examinations by Winston S. Churchill

II. The Portrait of a Lady by Khushwant Singh

Unit -II : Poetry **(3x5=15 Marks)**

a. Daffodils by William Wordsworth

b. A Psalm of Life by Henry W. Longfellow

Unit -III :

B. Essay **(10 Marks)**

C. Grammar **(10 Marks)**

Book Prescribed : Invitation to English - 1, 2, 3 & 4 , Published by Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar.

Alternative English

FIRST YEAR

APPROACHES TO ENGLISH, BOOK-I

Marks : 50

Prose (3x5=15 Marks)

Units to be studied :

- The Adventure of Learning
- Modern Living

APPROACHES TO ENGLISH, BOOK -II

Poetry (3x5=15 Marks)

Units to be studied :

1) Ecology (A.K. Ramanujan)
2) Dog's Death (John Updike)

GRAMMAR & USAGE (20 marks)

1) Tense and Aspect
2) Modals
3) The passive

APPROACHES TO ENGLISH, BOOK-I

SECOND YEAR

APPROACHES TO ENGLISH, BOOK-I

(Prose) (3x5=15 Marks)

Units to be studied

1) The Wonder World of
2) Science Our Environment

APPROACHES TO ENGLISH, BOOK-II
(Poetry) (3x5=15 Marks)

Units to be studied :

- Indian Children Speak (Juanita Bell)
- Mirror (Sylvia Plath)

GRAMMAR & USAGE (20 marks)

I. Revision of 'Tense and Aspect'

II. Clause-types

Word Order and Emphasis

Revised syllabus 2020-21
HORTICULTURE

(BASIC HORTICULTURE AND FRUIT CULTIVATION)

FIRST YEAR

Paper – I Theory

Full Marks : 40

UNIT - I

Basic Horticulture

Introduction, Definition of Horticulture, Divisions of Horticulture (Pomology, Olericulture, Floriculture, Spices, Plantation crops, aromatic and medicinal plants, fruit, nurseries, fruit and vegetable processing and marketing in brief)

UNIT - II

Soil

Types of soil, soil fertility, soil organic matter content, nature of soil suitable for production of horticultural crops.

UNIT - III

Climate

Climate factors influencing production of horticultural crops

UNIT - IV

Fruit Cultivation

Importance, present status and future prospects of fruit cultivation in India with special emphasis on Odisha. Cultivation aspects of major fruit crops with special reference to climate, soil, varieties, propogation, manuring, irrigation, inter culture, insect pests, diseases, disorders, intercropping, harvesting, yield, post harvest care, storage of mango, banana, citrus (sweet orange, mandarine) guava, papaya.

HORTICULTURE

(BASIC HORTICULTURE AND FRUIT CULTIVATION)

FIRST YEAR

Paper - I Practical

Full Marks : 60

Units

1. Identification of fruit trees and their varieties.
2. Selection of sites, planning, soil and soil management.
3. Method of planting of fruit plants (papaya, mango, banana)
4. Study of different inter cultural operations in fruit plants.
5. Study of method of manuring and fertilizer application in fruit plants with calculation of fertilizer requirement.
6. Training and Pruning in fruit plants.

HORTICULTURE

(POST HARVEST MANAGEMENT AND PRESERVATION OF FRUITS, VEGETABLES AND ORNAMENTAL CROPS)

FIRST YEAR

Paper - II Theory

Full Marks : 40

UNIT - I

Preservation and Post Harvest Losses

1. Importance of preservation and extent of post harvest losses.
2. Maturity standards of fruits and vegetables, handling, grading, packaging and transportation.

UNIT - II

Storage and growth regulations

1. Techniques of storage
2. Use of growth regulators and emulsion for extending the storage life.

UNIT - III

Principles of Preservation

1. Importance of preservation industry in India as well as in Odisha.
2. Principles and methods of preservation by low temperature, chemical additives, salt, sugar, heat, drying etc.
3. Preparation and preservation of fruit juice, squashes, jam, jelly, marmalade, pickles and sauces.

HORTICULTURE

(POST HARVEST MANAGEMENT AND PRESERVATION OF FRUITS, VEGETABLES AND ORNAMENTAL CROPS)

FIRST YEAR

Paper - II Practical

Full Marks : 60

Units

1. Importance of preservation and extent of post harvest losses.
2. Maturity standards of fruits and vegetables, handling, grading, packaging and transportation.
3. Techniques of storage.
4. Use of growth regulators and emulsions for extending the storage life.
5. Principles and methods of preservation by low temperature, chemical additives, salts, sugar, heat, drying etc.
6. Preparation and preservation of fruit juice, squashes, jam, jelly, marmalade, pickles and sauces.

HORTICULTURE

(Vegetable Production and Floriculture)
Second Year
Paper - III Theory

Full Marks : 40

UNIT - I

Importance of vegetables in human nutrition

Introduction, role of vegetables in human nutrition. Importance of vegetable cultivation present status and future prospects of vegetable cultivation in India as well as in Odisha. Classification of vegetable garden.

UNIT - II

Vegetable Cultivations

Details of vegetables cultivation with special reference of food value, varieties, climate, soil, nursery raising, sowing / planting, manuring, inter culture, irrigation, drainage, insect pests, beans, pea, cabbage, cauliflower, knoll khol, cucumber, bitter gourd.

UNIT - III

Floriculture

Introduction, importance of floriculture, present status and future prospects of floriculture in India as well as in Odisha. Definition of garden, garden features and adornments, lawn. Flowering trees, shrubs, creepers, annuals, culture of pot plants.

UNIT - IV

Cultivation practices of floriculture crops

Cultivation practices of commercial floriculture crops such as rose, dahlia, marigold, tuberose with special reference to verities, climate, soil, sowing, planting, manuring, inter culture, irrigation, drainage, insect pests, diseases, harvesting, yield, packaging and storage.

HORTICULTURE

VEGETABLE PRODUCTION AND FLORICULTURE

SECOND YEAR

Paper - III Practical

Full Marks : 60

1. Identification of vegetable seeds and seed testing.
2. Preparation and management of nursery beds (soil solarisation)
3. Treatment of seeds and seedlings both in kharif and rabi seasons.
4. Raising seedlings both in kharif and rabi seasons.
5. Controlling diseases and pests in nursery
6. Identification of vegetable crops in field.
7. Planting of vegetable seeds / seedlings.
8. Methods of application of manures and fertilizers (Basal and top dressing)
9. Study of types of manures and fertilizers.
10. Calculation of fertilizers for vegetable crops.
11. Identification of ornamental plants. (trees, shrubs, creepers and annuals)
12. Preparation and maintenance of lawn.
13. Preparation of planting materials for rose.
14. Potting and re-potting of ornamental plants.

HORTICULTURE

(PLANTATION CROPS, SPICES, MEDICINAL AND AROMATIC CROPS)

SECOND YEAR

Paper - IV Theory

Full Marks : 40

UNIT - I

Plantation Crops

Importance, scope and future prospects of plantation crops in India as well as in Odisha. Details of cultivation aspects with special reference to origin, climate, soil, varieties, propagation, planting, after care, manuring, irrigation, weeding, inter culture, insect pests, diseases, intercropping, harvesting, yield, post harvest care, storage, processing, value addition, by products, utilization of important plantation crops like coconut, cashew nut.

UNIT - II

Spices

Importance of spices, in India and Odisha, Classification of spices. Details of cultivation aspects of ginger, turmeric, black pepper, (special reference to climate, soil, varieties, land preparation, sowing, planting, manuring, irrigation, weeding inter culture, plant protection measures, harvesting, yield, processing and storage.

UNIT - III

Importance and classification of medicinal plant

Details of cultivation aspects (as mentioned in case of spice crops) of aloe vera, brahmi, aswagandha.

UNIT - IV

Importance and classification of aromatic plants

Cultivation practices, harvesting and oil extraction of lemon grass.

HORTICULTURE

PLANTATION CROPS, SPICES, MEDICINAL AND AROMATIC PLANTS

SECOND YEAR

Paper - IV Practical

Full Marks : 60

Units

1. Identification of plantation crops, spices, medicinal plants.
2. Raising seedlings of plantation crops, spices, medicinal and aromatic crops.
3. Methods of propagation (seed, cuttings, budding and grafting)
4. Study of processing of cashew nut.
5. Study of processing of black pepper and white pepper.
6. Oil extraction methods of aromatic plants.
7. Study of medicinal value of different medicinal plants.

Revised Syllabus 2020-21

INLAND FISHERIES

FIRST YEAR

Paper – I (Theory)

Marks : 40

Unit – I

Introduction to fisheries; importance of (global, India, Odisha context). Types of Fisheries: Freshwater, Brackish water, Estuaries, Riverine, Reservoirs, Lakes, etc.

Unit – II

Inland Fishery Resources, Freshwater Resources, Riverine Resources, Reservoirs, Lakes, Ponds and Tanks

Unit - III

Brackish water Resources, Lakes, Lagoons, Estuaries,. Inland fishery resources of Odisha

Unit - IV

Species contributing to inland fisheries. A general account of economically important freshwater and brackish water fin and shell fishes .

Unit - V

Food and feeding habits, growth, reproduction and migration of fishes.

INLAND FISHERIES

FIRST YEAR

Paper - I (Practical)

Marks: 60

1. Study of morphometry of typical fin fish and shell fishes.

2. Identification of common freshwater, brackish water, marine fishes and prawns.

3. **deleted**

4. Measurement of fish length and weight for growth studies.

5. Preparation of record.

INLAND FISHERIES

FIRST YEAR

Paper - II (Theory)

Marks : 40

Unit - I

Fisheries of reservoirs and lakes, Conservation of fish stocks, Stocking with fish and capture management.

Unit - II

deleted

Unit - III

Fisheries Resources of Lake Chilika and Anshupa (Odisha)

Unit - IV

deleted

Unit - V

Catching devices, Common inland fishery crafts and gears, their usefulness, operation, restriction of uses and Fish aggregating devices.

INLAND FISHERIES

FIRST YEAR

Paper - II (Practical)

Marks : 60

1. Common crafts and gears used in fishing activities.

2. Operation of common fishing crafts and gears.

3. **Deleted**

4. Visit to fish landing centres (Reservoirs, Lakes and Rivers), Fish Marketing and Record fish catch.

5. Preparation of Records.

INLAND FISHERIES

SECOND YEAR

Paper - III (Theory)

Marks : 40

Unit - I

History of aquaculture: Present Global and National scenario, Principles of Aquaculture and Importance of aquaculture.

Unit - II

Culture Practices: Conventional mono culture, composite fish culture, mixed culture, integrated aquaculture, criteria for selection of candidate species for aquaculture.

Unit - III

Method of culture, Tradition / Extensive, Semi intensive and intensive aquaculture in inland water bodies.

Unit - IV

Types of fish farms, freshwater/ brackish water, Types of Ponds, Nursery, Rearing, Grow out. Lay out design and construction of fish farm.

Unit - V

Location, design and construction of hatcheries, design and construction of cage, and pens for the culture.

INLAND FISHERIES

SECOND YEAR

Paper - III (Practical)

Marks : 60

1. Collection, preservation and identification of major cultivable fin fish and shellfishes.

2. Identification of fish fry and fingerlings.

3. Identification of post larvae of fresh water prawn.

4. Identification of nauplius, mysis, zoea and juveniles of brackish water prawn

5. Identification of common aquatic weeds, insects, weed fishes and predatory fishes of culture pond.

6. Visit to fish farm and study culture practices, improvement of village tank for fish culture.

7. Preparation of record.

INLAND FISHERIES

SECOND YEAR

Paper - IV (Theory)

Marks : 40

Unit - I

Freshwater aquaculture, nursery, rearing and grow out pond preparation and management. control of aquatic weeds, predatory and weed fishes, algal blooms, liming, fertilization / manuring, use of bio-fertilizers, stocking, feeding to fishes, pond environment management, fish health management, harvesting.

Unit – II

Freshwater prawn culture and important species for culture, seed stocking and culture practices, Brackish water aquaculture, important fin fish and shellfishes for culture, culture practices.

Unit – III

Ornamental fish culture, important indigenous and exotic ornamental fishes, preparation of indoor system for culture and their rearing management.

Unit - IV

Cat fish and air breathing fish culture. Important species for culture, seed stocking and culture practices.

Unit - V

Integrated aquaculture, principle, fish cum duck culture and fish cum cattle rearing.

INLAND FISHERIES

SECOND YEAR

Paper - IV (Practical)

Marks : 60

1. water analysis; water pH, carbon dioxide, total hardness, total alkalinity, salinity, nutrients.

2. Home aquarium preparation; construction, setting and maintenance.

3. Identification of different fish food organisms.

4. Identification of locally available fish feed ingredients and formulation of fish food.

5. **deleted**

6. Identification of common fish diseases.

7. Methods of application of manures and fertilizers.

8. Preparation of record.

Revised Syllabus 2020-21
M.I.L. (Hindi)

FIRST YEAR

Full Mark : 50

Unit- I : गद्य भाग **(20 marks)**

प्रेमचंद - जीयन मे साहित्य का स्थान

दिनकर ईर्ष्या, तू न गई मेरे मन से

Unit- II : काव्य भाग **(20 marks)**

कबीरदास - दोहे

सूरदास - बाल लीला

सुमित्रानंदन पंत - भारतमाता

अक्षेय - हीरोशिमा

Unit – III : कार्यालयी हिन्दी और रचनात्मक लेखन **(10 marks)**

1. व्याकरण (क) क्रिया (ख) काल
2. अपठित गद्यांश OR निबंध लेखन

पुस्तक : अमृत भारती, भाग I

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M.I.L (HINDI) - II

Second Year

Full Marks - 50

Unit- I : गद्य भाग **(20 marks)**

बालकृष्ण भट्ट - आत्मानिर्भरता

शरह जोशी - टुम जाओगे, अतिथि

Unit- II : काव्य भाग **(20 marks)**

रहीम दोहे

मैथिलीशण गुप्त - नर हो, न निएश करो मन को

निराला - वीणा वादिनी वट हे, बादल एग

मुक्ति बोध - पूँजीवादी समाज के प्रटि

Unit – III : कार्यालयी हिन्दी, व्याकरण और पत्त लेखन **(10 marks)**

1. व्याकरर (क) लिंग (ख) वचन

2. अपठित गद्यांश OR पत्र लेखन

पुस्तक : अमृत भारती, भाग - २

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Revised Syllabus 2020-21

MIL (O)

ଆଧୁନିକ ଭାରତୀୟ ଭାଷା ଓଡ଼ିଆ

ପ୍ରଥମ ବର୍ଷ (୧ମ ଭାଗ)

ପୂର୍ଣ୍ଣ ସଂଖ୍ୟା – ୫୦

ପ୍ରଥମ ଏକକ – ଗଦ୍ୟ (୨୦ ନମ୍ବର)

୧. ଝେଲମ୍ ନଦୀରେ ସଂଧ୍ୟା – କୁଞ୍ଜବିହାରୀ ଦାଶ

୨. ମଧୁବାବୁ – ଚିନ୍ତାମଣି ଆଚାର୍ଯ୍ୟ

ଦ୍ୱିତୀୟ ଏକକ - ପଦ୍ୟ (୨୦ ନମ୍ବର)

୧. ଶାପ ମୋଚନ - ଜଗନ୍ନାଥ ଦାସ

୨. ହିମକାଳ - ଦୀନକୃଷ୍ଣ ଦାସ

ତୃତୀୟ ଏକକ ପ୍ରବନ୍ଧ ଓ ବ୍ୟାକରଣ(୧୦ ନମ୍ବର)

ପଦ ପ୍ରକରଣ - ବିଶେଷ୍ୟ ,ବିଶେଷଣ

ପାଠ୍ୟଗ୍ରନ୍ଥ – ସାହିତ୍ୟ ଜ୍ୟୋତି, ପ୍ରଥମ ଭାଗ

ଓଡ଼ିଶା ରାଜ୍ୟ ପାଠ୍ୟ ପୁସ୍ତକ ପ୍ରଣୟନ ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର

MIL (O)

ଆଧୁନିକ ଭାରତୀୟ ଭାଷା ଓଡ଼ିଆ

ଦ୍ୱିତୀୟ ବର୍ଷ ଭାଗ)

ପୂର୍ଣ୍ଣ ସଂଖ୍ୟା – ୫୦

ପ୍ରଥମ ଏକକ – ଗଦ୍ୟ (୨୦ ନମ୍ବର)

୧. ସ୍ୱାଧୀନ ଦେଶର ଶିକ୍ଷା ଚିନ୍ତା – ଗୋଲୋକ ବିହାରୀ ଧଳ

୨. ତିନି ତୁଣ୍ଡରେ – ଭୁବନେଶ୍ୱର ବେହେରା

ଦ୍ୱିତୀୟ ଏକକ - ପଦ୍ୟ (୨୦ ନମ୍ବର)

୨. ତପସ୍ୱିନୀର ପତ୍ର – ଗଙ୍ଗାଧର ମେହେର

୩. ବନ୍ଦୀର ବିରହ ବ୍ୟଥା – ଗୋପବନ୍ଧୁ ଦାସ

ତୃତୀୟ ଏକକ ପ୍ରବନ୍ଧ ଓ ବ୍ୟାକରଣ (୧୦ ନମ୍ବର)

ରୂଢ଼ି ପ୍ରୟୋଗ , ବିପରୀତାର୍ଥ ବୋଧକ ଶବ୍ଦ

ପାଠ୍ୟଗ୍ରନ୍ଥ – ସାହିତ୍ୟ ଜ୍ୟୋତି, ପ୍ରଥମ ଭାଗ

ଓଡ଼ିଶା ରାଜ୍ୟ ପାଠ୍ୟ ପୁସ୍ତକ ପ୍ରଣୟନ ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର

Mark Distribution
Prose:
8 Multiple Choice Question-1x8=8
One short answer type Question(100 words) 1x5=5
One Long type Question (150 words) 1x7=7
Poetry:
Same as prose
Grammar:
All questions carry 01 mark – 1x10=10

M.I.L (SANSKRIT)

FIRST YEAR

Full Marks 50

Time : 2 Hrs.

Distribution of Marks

Unit – I	:	Prose	:	20 Marks
Unit-II	:	Poetry	:	20 Marks
Unit – III	:	Grammar	:	10 Marks

Unit - I

1.	Multiple choice questions from Prose	:	1 x 10 = 10
2.	Short Questions from Prose	:	2 x 3 = 6
3.	Translation from Prose Text to Odia / English	:	2 x 2 = 4

Unit - II

1.	Multiple choice questions from Poetry	:	1 x 10 = 10
2.	Short Questions from Poetry	:	2 x 3 = 6
3.	Translation of Verse to Odia / English	:	2 x 2 = 4

Unit - III

1.	Stripratyaya	:	1 x 2 = 2
2.	Sandhivichheda	:	1 x 2 = 2
3.	Prakrutipratyaya	:	1 x 3 = 3
.			
5.	Ekapadikarana	:	1 x 2 = 2

OR

Application / Letter Writing 10 Marks

OR

Comprehension one Passage from Text (1 – 8) (2 x 5 = 10)

M.I.L (SANSKRIT)

SECOND YEAR

Full Marks 50

Unit – I	:	Prose	:	20 Marks
Unit-II	:	Poetry	:	20 Marks
Unit – III	:	Grammar	:	10 Marks

Unit - I

1.	Multiple choice questions from Prose	:	1 x 10 = 10
2.	Short Questions from Prose	:	2 x 3 = 6
3.	Translation from Prose Text to Odia / English	:	2 x 2 = 4

Unit - II

1.	Multiple choice questions from Poetry	:	1 x 10 = 10
2.	Short Questions from Poetry	:	2 x 3 = 6
3.	Translation of Verse to Odia / English	:	2 x 2 = 4

Unit - III

1.	Sabdarupa	:	1 x 2 = 2
2.	Dhaturupa	:	1 x 2 = 2
3.	Stripratyaya	:	1 x 3 = 3
5.	Karaka - Vibhakti	:	1 x 3 = 3

OR

Comprehension of one Passage from Text (9 – 16) 10 Marks

OR

Explanation of a Verse from Poetry Text 10 Marks

M.I.L. (SANSKRIT)
FIRST YEAR
UNIT – I

Prose **(20 Marks)**

Sanskrutaprabha (Gadyabhagah)

संस्कृतप्रभा-गद्यभाग:

The following prose pieces from the above mentioned book are to be studied

1. मनुमत्स्याख्यानम् (Manumatsyakhyanam)
2. चतुरशृगाल: (Chaturasrugalah)

UNIT – II

Poetry **(20 Marks)**

Samskrtaprabha (Podyabhagah) संस्कृतप्रभा (पद्यभाग:)

The following poetry pieces from the above book are to be studied

1. सुभाषितावली (Subhasitavali)

UNIT – III

GRAMMAR **(10 Marks)**

a. Grammar from the Prose and Poetry

1. सन्धि - सन्धिविच्छेद Sandhi and Sandhi Viccheda
2. प्रकृतिप्रत्यय (Prakrti Pratyaya)

b. Topics from the Grammar text

3. स्त्रीप्रत्यय Stripratyaya
4. एकपदीकरण Formation of single word from Stripratyaya and Samasa

2. **Translation and Comprehension**

Comprehension - Sanskrit Passage from the comprehension pasages of संस्कृतप्रभा, Part - I

3. **Writing Skill**

The art of writing - letters, Applications, Textual Explanation, Textual long questions.

Books Recommended

Sanskrtaprabha, Part - I - संस्कृतप्रभा - प्रथमोभाग:

Published by Odisha State Bureau of Textbook Preparation and Production.

Vyakarana - darpan – व्याकरण दर्पण:

Published by Odisha State Bureau of Textbook Preparation and Production.

M.I.L (SANSKRIT)

SECOND YEAR

Full Marks 50

UNIT – I

Prose **(20 Marks)**

Prose - Sanskrutaprabha (Gadyabhagah)

संस्कृतप्रभा - गद्यभाग:

The following prose pieces from the above mentioned book are to be studied

1. कपोतलुब्धककथा (Kapotalubdhakakatha)
2. गुणिगुणहीनविवेक: (Gunigunahinavivekah)

UNIT – II

Poetry **(20 Marks)**

Poetry - Samskrtaprabha (Podyabhagah)

संस्कृतप्रभा (पद्यभाग:)

The following poetry pieces from the above book are to be stuided

1. गीतासवरभम् (Gitasourabham)

UNIT – III

(10 Marks)

GRAMMAR

a) 1. कारकविभक्ति (Karak Vibhakti)

b) Topics from the Grammar text

1. शब्दरूप Sabdarupa (नर, फल, लता, मुनि, मति, वारि, नदी, पितृ, मातृ, गच्छत्, मनस्, आत्मन्, तद्, किम्, इदम्, अस्मद्, युष्मद्, द्वि, त्रि, चतुर)
2. धातुरूप ॅूल्ल्ज् (भू, गम्, पठ्, कृ, अस्, लभ्, पूज्)

4. स्त्रीप्रत्यय Stripratyaya

2. **Translation and Comprehension**

1. Comprehension - Sanskrit Passage from the comprehension pasages of संस्कृतप्रभा, Part-II

Writing Skill

The art of writing - Textual Explanation, Textual long questions and Precis writing.

Books Recommended

1. Sanskrtaprabha, Part – II – संस्कृतप्रभा द्वितीयोभाग:

   Published by Odisha State Bureau of Textbook Preparation and Production.

2. Vyakarana - darpan व्याकरण दर्पण:

Published by Odisha State Bureau of Textbook Preparation and Production.

Revised Syllabus 2020-21 (Voc)
M.I.L (TELUGU)

FIRST YEAR

Full Marks 50

Distribution of Marks

Unit – I	:	Prose	:	20
Unit – II	:	Poetry	:	20
Unit – III A	:	Grammar	:	10
B	:	General Essay		

Unit – I

1. Eight nos of Short Objective Type Questions one mark each : 08
2. One Short Question of 100 words : 05
3. One Long Question of 200 words : 07

Unit – II

1. Eight nos of Short Objective Type Questions one mark each : 08
2. One Short Question of 100 words : 05
3. One Long Question of 200 words : 07

Unit – III

1. A. Grammar – Vibhakti, Pratyayalu, Paribhasika, Padamulu : 05

   Five Short Questions (One mark each)

2. B. General Essay : 05

M.I.L (TELUGU)

SECOND YEAR

Full Marks 50

Unit – I	**:**	**Prose**	**:**	**20**
Unit – II	**:**	**Poetry**	**:**	**20**
Unit – III A	**:**	**Grammar**	**:**	**10**
	B :	**Re-translation**		

Unit – I

1. Eight nos of Short Objective Type Questions one mark each : 08
2. One Short Question of 100 words : 05
3. One Long Question of 200 words : 07

Unit – II

1. Eight nos of Short Objective Type Questions one mark each : 08
2. One Short Question of 100 words : 05
3. One Long Question of 200 words : 07

Unit – III

1. A. Grammar – Alankaras, Chandassu : 05
2. B. Re-translation : 05

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M.I.L. (TELUGU)

FIRST YEAR

F.M.:50

UNIT – I

Prose **(20 Marks)**

1. MitraLabhamu - Paravastu Chtnnayasuri

2. Teiugu Patrikala Purva Rangam - Namala Visveswara Rao

UNIT – II

Poetry **(20 Marks)**

1. Balivamana Samvadamu - Bammera Potana
2. Subhashitamulu - Enugu Lakshmana Kavi
3. Tokachukka - Gurajada Apparao

UNIT – III

(10 Marks)

4. **GRAMMAR –**

II. Paribhasika Padamulu

5. **WRITING / GENERAL**

ESSAY BOOKS PRESCRIBED :

6. Poetry & Prose : SAHITEE VIPANCHI - By Dr. Singupuram Narayana Rao
7. Grammar - VYAKARANA PARIJATAMU - - By Dr. Singupuram Narayana Rao

M.I.L (TELUGU)

SECOND YEAR

Full Marks 50

UNIT – I

Prose **(20 Marks)**

1. MitraBhedamu - Paravastu Chinnayasuri

2. Goutama Budhudu - Dr.- V. Rajagopala Chakravarty

UNIT – II

Poetry **(20 Marks)**

1.

2. Hanumatsandesamu - Atukuri Molla

3. Piradausi.Lekha - Gurram Jashuwa

4. Manchi Mutyala Saralu - Sri Sri

UNIT – III

(10 Marks)

1. GRAMMAR – Alankaramulu,

2. RE-TRANSLATION

BOOKS PRESCRIBED

Poetry & Prose : Sahitee Mandaram By Dr. Singupuram Narayana Rao

Grammar : Vyakarana Parijatamu By Dr. Singupuram Narayana Rao

Revised Syllabus 2020-21

MIL (URDU)

Mark Distribution

+2 First Year & Second Year

F.M. 50

Group A

1. Five Objective Types multiple choice question from prose and poetry .	1 x 5 = 05
2. Ten Short Question in one hundred words or one sentence	1 x 10 = 10

Group B

3. Answer within two/three sentences from prose,Poetry& Ghazaliyat portions (Ten questions to be answered out of Fifteen)	**2x10=20**

Group C

4. Long type answer	
A. Prose; One Long answer type Question about 150words with an alternative from prose portion	5 Marks
B. Poetry: One Long answer type Question about 150words with an alternative from poetry portion	5 Marks
C. Essay: One Long answer type question about 150 words out of three essays	5 Marks

FIRST YEAR

Books Prescribed ; - "JADIDADAB PARE" Part – I

Edited by : - Dr. Azizur Rahman

Mir Ashraf Ali

Recommended Book "JADIDADAB PARE" Part I published by Odisha State Bureau of Text Book preparation and Production, Pustak Bhawan, Bhubaneswar for the students of +2 level in Arts / SC / Commerce Stream

Total classes-30

UNIT-I

1. **Prose Chapters to be studied** :- (10 Classes)
   1. Sair Pahle Darwesh Ki – Mir Amman

UNIT - II

2. **Poetry** (13 Classes)

   Chapters to be Studied :-

   (i) Tasweere – e – Dard – Iqbal

   (ii) Jogan Aur Chandni Raat – Mir Husan.

   (b) **Ghazliyat Portims to be studied**

   - Ghalib

Unit - III

3. Urdu Zoban – O – Qwaid – Part – I by Shafi Ahmad Siddiqui. (15 Classes)

   Chapter to be Studied : -

   1. Tazkir O Tanees

SECOND YEAR

Book Prescribed : Jadid Adab Pare – Part-II

Edited by : Dr. Azizur Rahman

Mir Ashraf Ali

Recommended Book "JADID ADAB PARE – PARE Part II" published by Odisha State Bureaue of Text Book preparation and production, Pustak Bhawan, Bhubaneswar. For the Students of +2 Level in Arts ,Science, Commerce stream

Total classes 30

Unit – I

5. Prose chapters to be studied. (15 Classes)
    1. Hindu Musalman Eik Qaum – Sir Sayed Ahmad
    2. Ustad Ki Talas : - Farhatullah Baig

Unit – II

3. Poetry chapters to be studied. (12 Classes)
    1. Tajmahal Ki Pahli Jhalak Per : Dr. Karamat Ali Karamat.
2. Ghazliyat Poets to be studied.
    1. Dagh

Unit – III (Three Classes)

2. Essay /

Revised Syllabus 2020-21
PARAMEDICAL HEALTH CARE (PHC)

AND

MEDICAL LABORATORY TECHNIQUES (MLT)

First Year

PAPER – 1

Theory - 40

Unit - I : Human Anatomy

- Introduction to Anatomy
  - Different parts of Human Body,
  - Anatomical position, Directional terms, Common anatomical places
  - Systemic and regional anatomy
- Histology
  - Typical animal cell-structure and functions
  - Tissues of the body classification and function
- Skeletal System
  - Bones of the skull, vertebral column, shoulder girdle, thoracie
  - cage and pelvic girdle
  - Bones of the limbs
  - Joints and movements
- Muscular system
  - Types of muscles
  - Principle muscles of the body; tendons, fascias

Unit - II : Nervous system

- Central nervous system, Brain meninges, CSF, Spinal cord
- Peripheral nervous system cranical, spinal nerves system,
- autonomic nervous system

- Sympathetic and para sympatghetic

❖ Cardiovascular system

- Heart
- Blood Vessels

❖ Lymphatic and RE system, Spleen

❖ Respiratory system

- Nose, Pharynix, Laryns, Tonsils
- Trachea, Bronchi
- Lungs and Pleura

❖ Alimentray System

- Mouth and Oesophagus,
- Stomach,
- Pancreas, liver and gall bladder
- Intestines, peritoneum

❖ Urinary system

- Kidneys
- Ureter, urinary bladder and uretnra

❖ Reproductive System

- Male genital system
- Female genital system and accessory ovgans

❖ Skin

❖ Special Senses

- Eye and vision
- Ears and hearing equilibrium
- Taste, Smell, General Sensibility Viz. touch etc. surface anatomy'

Unit - III : Head and neck

- Thorax{Heart and lungs) and abdomen (Stomach, Spleen liver,
- kidney and bladder)
- Places and regions of abdomen and location of different organs
- in stomach
- Surface marking of important blood vessels, nerves and muscles
- for injection

Unit-IV : Human Physiology

- Blood
  - Composition and general functions of blood
  - Description of blood cells- normal counts and functions steps of coagulation
  - Anticoagulants
  - Cerebrospinal fluid, formation, composition and function, Blood groups ABO and RH basis for classification, importance of blood groups, compositions and functions of lymph
- Respiratory System
  - Name and structures involved in respiration and their function. External and internal respiration
  - How inspiration expiration are brought about
  - Transport of O_2 and CO_2 in the blood
  - Definition of respiratory rate, Tidal volume, vital capacity
  - Hypoxia
- Excretory System
  - Functions of kidney
  - Nephron - functions of glomerulus and tubules, Composition of Urine, normal and abnormal
- Skin

- Functions of skin

❖ Digestive Systems

- Composition and functions of saliva, mastication and deglutition
- Functions of stomach, composition of gastric juice, pancreatic juice
- Bile and success enteritis
- Digestion of food by different enzymes, absorption and defection

❖ Endocrine - glands

- Definition of endocrine gland, name of the endocrine glands and the hormones secreted by them

- Major actions of each hormone
- Reproductive system
- Name of primary and accessory organs in male and female
- Name of secondary sexual characters in male and female
- Functions of ovary-formation of ova, actions of ovarian hormones, Menstrual cycle
    - Function of Testis - Spermatogenesis and actions of Testosterone, Fertilisation
    - Vasectomy and Tubectomy

PARAMEDICAL HEALTH CARE (PHC)

AND

MEDICAL LABORATORY TECHNIQUES (MLT)

FIRST YEAR

Paper - I Practical

Marks : 60

Units

❖ Exhibition of Human Anatormy and indentificaiton report.

❖ Cleansing of glasswares (Pipettes, slides, and cover slips, syringes and needles, blood cell diluting pipettes, glassware used for bacteria investigation)

- ❖ Making simple glass items in the laboratory (pasture pipette, stirring bending glass and preparing a wash bottle)
- ❖ Demonstration of use and care of instruments, cautions precautions to be taken
- ❖ Demonstration of safety measures during work in laboratory in various fields

PARAMEDICAL HEALTH CARE (PHC)

AND

MEDICAL LABORATORY TECHNIQUES (MLT)

Paper – II (Theory)

Marks : 40

Unit-I : Laboratory Management and Ethics

- ❖ Role of laboratory in health care deliver
    - General
    - Human health and diseases
        - Types of diseases
        - Process of diagnosis
    - Laboratory at different level
    - Duties and responsibility of laboratory persons
- ❖ Laboratory services in the health delivery system
    - o Laboratory service in India
    - o The health administration system in India
        - At the National level
        - At the state level
        - At the district level
        - At the village level
        - Voluntary health organisations in India
        - Health programmes in india

Unit - II : Laboratory Planning

- ❖ General principles
- ❖ Laboratory goals
- ❖ Operational data
    - o Market potential
    - o Hospital/laboratory relatives
    - o Competitions
    - o Laboratory trends

Unit - III : Planning at different levels

- ❖ Hospital laboratory services
    - Factors
    - Guiding principles for planning
    - Functions criteria
    - Operational demand
    - Sections of a hospital laboratory
    - Common areas
    - Design aspect
    - Space requirement
- ❖ Planning for 3 basic health laboratory

Unit - IV

- ❖ Health and Sanitation
- ❖ Disease Prevention & Community Organisation

PARAMEDICAL HEALTH CARE (PHC)

AND

MEDICAL LABORATORY TECHNIQUES (MLT)

Paper – II (Partical)

Marks : 60

Units

- Demonstration of safe handling of specimens and infections agents including HBs Ag (Hepatitis) and AIDs (HIV)
- Specimen handing collection, preservation, transportation, disposal
- Laboratory safety and First Aid
- Biomedical waste Treatment.
- Computer application
- Study of Community Health Awareness programme (Any Five Programmes)

PARAMEDICAL HEALTH CARE (PHC)

AND

MEDICAL LABORATORY TECHNIQUES (MLT)

Second Year

Paper – III (Theory)

Theory - 40

Unit-I

Biochemistry

Unit - I : Inorganic and physical aspects of biochemistry, structure of atoms, symbol, valency and formula

- Chemical units- Atomic weight, molecular weight, gram mole Equivalent weight, gram equivalent
- Fundamental laws of Chemistry
- Acids, bases and salts
- Hydrogen concentration and pH Measurement - Indicators and pH meter
- Buffers, preparation
- Solutions - solute and solvent, saturated solutions, solubility Temp. effects
- Concentrations of solutions in different ways viz molar normal percentage etc.
- Simple qualitative analysis - captions Anions
- Volumetric (Titrimetric) analysis
- Primary and secondary standards
- Acid-base titrations, permanaganometry
- Rules in volumetric analysis
- Isotopes definition/examples/uses

Unit - II : Chemistry of Bimolecular - carbohydrates, lipids, amino-acids, proteins, nucleic acids, Vitamins

- ❖ Isotopes

Unit - III : Clinical Biochemistry

- Bioenergetics - Respiratory Chain, Oxidative, Phosphorylation
- Overview of Metabolism
- Carbohydrate Metabolism
  - Glycolysis and TCA cycle
  - Blood glucose homeostasis
  - Measurement of blood glucose
  - Glycosuria, Diabetes mellitus

❖ Lipid Metabolism

- Cholesterol
- Triglycerides
- Lipoproteins
- Ketone bodies - formation, ketosis, ketonuria

❖ Amino acid & Protein metabolism

- Urea synthesis - uremia
- Other non operation nitrogenous compound like vaginate uvicacid
- Biochemical veactions of aminoacids Transamination, deamination
- Synthese of physiologically important substances from aminoacids

Unit - IV

- Metabolic inter-relationships
- Principles of inborn errors of metabolism

- Water, Na+K=and Cl, Bicarbonates, Acid Base Balance, calcium and Phosporous

- Role and iron, Iodine and other Trace elements

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PARAMEDICAL HEALTH CARE (PHC)

AND

MEDICAL LABORATORY TECHNIQUES (MLT)

Paper - III (Practical)

Marks : 60

- Visit of a pathological laboratory and submission of a report analysis of pathologic test with the help of a computer

- Analysis of CBC, Lipid Profile, Vitamin D, Calcium

PARAMEDICAL HEALTH CARE (PHC)

AND

MEDICAL LABORATORY TECHNIQUES (MLT)

Paper – IV (Theory)

Marks : 40

Unit - I General Principles of Laboratory Technology

- Deleted

Unit – II : Laboratory organization

- Genera! principles

- Components and functions of a laboratory
- Staffing the laboratory
- Job description- job specifications
- Work schedule- personal rearrangement and work load assessment

❖ Care of laboratory glassware, equipments and chemicals verbal

❖ Different types of glassware and plastic ware

Care and cleaning of glass wares

Making simple glasswares in the laboratory

Care of equipments and apparatus

Laboratory chemicals, their proper use and care, storage

Labeling

❖ Specimen handling

- ❖ Collection techniques and containers for specimen collection
- ❖ Types of specimen
  - Entry, handling
  - Specimen transport
  - Specimen disposal
  - Specimen preservation

Unit – III : Laboratory safety

- General principles
- Laboratory hazards
- Safety programme
- First aid
- Safety measure - mechanical, electrical, chemical, Biological & radioactive

- ❖ Communication: Personnel Development and Relations, general principles

  Inter/intra departmental communications request/report forms

- ❖ Basic Principles of quality control
  - General Principles

- ❖ Basic Medical Nursing

Unit. IV : Clinical Pathology

- ❖ Urine analysis
  - Physical, Chemical, Microscopic
- ❖ Faucal analysis
  - Physical
  - Chemical- Occult blood exam.
  - microscopic
- ❖ Sputum analysis - physical and microscopic
  - Seminal Fluid analysis
  - Examination of aspiration fluid
  - Ascitic fluid
  - Pleural fluid
  - CSF
  - others
- ❖ Pregnancy tests

PARAMEDICAL HEALTH CARE (PHC)

AND

MEDICAL LABORATORY TECHNIQUES (MLT)

Paper – IV Practical

Marks : 60

Units

- Routine analysis of urine
- Examination of sputum
- Seminal fluid analysis
- Analysis of aspiration fluid
- Pregnancy test - urine for HCG
- FISH – Fluorescene in Sites hybridizaiton
  - PCR – Polyclonal Chain reaction
  - CD4 , CD8 Level
  - Flow Cytometry
  - Immuno histochemistry (IHC)
  - ELISA
  - Electrophorsis
    - Hb
    - Serum

Revised Syllabus 2020-21

POULTRY FARMING

FIRST YEAR

PAPER – I (THEORY)

Full Marks : 40

Unit – I

- **Importance of egg and meat in human diet**

Unit - II

- **External body parts of chicken.**
- **Anatomy and physiology – brief outlines of Digestive system and Reproductive system.**

Unit – III

- **Formation of egg and Composition of egg with its nutritional values.**

Unit - IV

- **Common breeds of chicken.**
- **Breed characteristics and utility.**

POULTRY FARMING

FIRST YEAR

PAPER – I (PRACTICAL)

Full Marks : 60

1. **Body points of chicken .**
2. **Handling, catching , debeaking, dewinging.**
3. **Identification of internal organs : different parts of digestive and reproductive system.**

POULTRY FARMING

FIRST YEAR

PAPER – II (THEORY)

Full Marks : 40

Unit - I

- **Specific strains developed for rural poultry production, their acceptability and importance in rural system.**

Unit - III

- **Preliminary idea on different breeding method practiced in poultry farm.**
- **Different systems of mating : Flock mating.**
- **Preliminary idea on artificial insemination.**

Unit - IV

- **Estimation of egg production – Hen housed, Hen day and Survivor egg production.**
- **Recording of body weight in broiler birds.**

POULTRY FARMING

FIRST YEAR

PAPER – II (PRACTICAL)

Full Marks : 60

1. **Identification of poultry breeds – White Leghron (WLH), Rhode Island Red (RIR), Vanaraja, Giriraja, Grama Priya, Kadaknath, Aseel and some commercial broiler strains.**
2. **Identification of good layers, poor layers and non-layers.**

POULTRY FARMING

SECOND YEAR

PAPER – III (THEORY)

Full Marks : 40

Unit - I

- **Selection of site.**
- **Types of poultry houses – free range, semi intensive, intensive and**
- **backyard, low cost poultry houses.**
- **Deep litter system of housing, its advantages and disadvantages.**

Unit - II

- **Litter materials, Built-up litter as manure and its utility values, management of litter. Types of poultry equipment like feeder, water / drinker and brooder and chick guard etc.**

Unit - III

- **Feeding Management**
- **Nutrient requirements and feed formulations.**
- **Additives and supplements.**
- **Utiliation of local available local ingredients used in poultry feed.**

Unit - IV

- **Factor affecting egg production**
- **Selection and care of hatching eggs**
- **Candling of eggs**
- **Incubation principles and practice**
- **Different fumigation process in hatchery.**
- **Factors affecting hatchability and fertility.**

POULTRY FARMING

FIRST YEAR

PAPER – III (PRACTICAL)

Full Marks : 60

1. **Different components of hatchers and setters and their utility.**
2. **Setting of eggs for hatching.**
3. **Candling of eggs.**
4. **Different method of culling procedure**
5. **Identification of common feed ingredients**

POULTRY FARMING

SECOND YEAR

PAPER – IV (THEORY)

Full Marks : 40

Unit - I

House preparation before and after arrival of chicks in the farm. Brooding and rearing of chicks. Rearing and management of grower, breeder / layers. Light management of broilers and layers.

Unit - II

Management and care under adverse conditions and seasonal managements. Preliminary idea of moulting of poultry birds used for egg production. Culling of different age groups of stocks.

Unit - III

Classification of poultry diseases. Common disease of poultry; Ranikhet Disease, Fowl Pox, Marker's disease, Infectious Brasal Disease, Aviam Influence (Bird Flu),Chronic Respiratory Disease (CRD), Salmonellosis, E.Coli and their prevention & control.

Unit - IV

Round worm infestation. Cannibalism, bound condition, different vices of poultry, vaccination schedule of layer and broiler birds. Bisecurity in poultry farms.

POULTRY FARMING

SECOND YEAR

PAPER – IV (PRACTICAL)

Full Marks : 60

1. **Identification of different types of houses and equipments.**
2. **Identification of different litter materials .**
3. **Vaccination**
4. **Identification of healthy & unhealthy birds.**

Revised Syllabus 2020-21

REPAIR AND MAINTENANCE OF POWER DRIVEN FARM MACHINERY (PDFM)

FIRST YEAR

PAPER-I (THEORY)

Marks-40

Unit No.	Topic	
Unit-I	Primary Tillage Machinery	Definition and objectives of tillage; requirements of primary tillage; types of primary tillage machinery; **Mould board plough:** types, parts and functions, adjustments of plough: horizontal and vertical suction; **Disc plough:** types, parts and functions, adjustments of disc and tilt angles
Unit-II	Secondary Tillage Machinery	Objectives and requirements of secondary tillage; types of secondary tillage machinery; **Cultivators:** types, parts, function and adjustment. **Rotavator:** parts, function and adjustment.
Unit-III	Sowing Machinery	Methods of sowing; **Seed drills:** plain drills and seed cum fertilizer drills, various parts and their functions, types of seed metering devices. **Planters:** types, parts and their functions. **Rice transplanters:** types, working principles, nursery raising techniques.
Unit-IV	Plant Protection Equipment	Objectives of application of agricultural chemicals; **Power sprayers:** types, parts and their functions. **Dusters:** types, parts and their functions. Safety precautions in handling of chemicals.

REPAIR AND MAINTENANCE OF POWER DRIVEN FARM MACHINERY (PDFM)
FIRST YEAR
PAPER- I (PRACTICAL)

Marks-60

Unit No.	**Topic**	
Unit-I	Primary Tillage Machinery	**Mould Board Plough:** Identification of different parts of tractor operated mould board plough, dismantling of mould board plough, reconditioning/ replacement of damaged/worn-out parts, assembling of different parts of mould board plough. **Disc Plough:** Identification of different parts of disc plough, dismantling of disc plough, reconditioning/ replacement of damaged/worn out parts, assembling of different parts of disc plough
Unit-II	Secondary Tillage Machinery	**Rotavator:** Identification of different parts of rotavators and rotary tillers, dismantling of rotavators / rotary tillers, reconditioning / replacement of damaged/ worn out parts, assembling and lubrication, Adjustments for better performance. **Cultivator:** Identification of different parts of a cultivator, arrangement of tynes in a cultivator, fore and apt adjustment of cultivator, replacement of cultivator tynes.
Unit-III	Sowing Machinery	Identification of different parts of seed cum fertilizer drill, reconditioning/ replacement of damaged/worn out parts of the seed-cum-fertilizer drill, dismantling of seed and fertilizer metering mechanisms and study of its parts. Identification of different parts of planters, reconditioning/replacement of damage/worn out parts, familiarization with different types of furrow openers, selection of proper seed metering plates. Familiarization with different parts of rice transplanters, study of seedling tray and finger movement mechanism.
Unit-IV	Plant Protection Equipment	Identification of different parts of power sprayers, dismantling of sprayer, reconditioning/replacement of worn out/damaged parts, assembling of sprayer and resetting of nozzle and cut-off device, operation and calibration of sprayer for specific applications.

REPAIR AND MAINTENANCE OF POWER DRIVEN FARM MACHINERY (PDFM)

FIRST YEAR
PAPER-II (THEORY)

Marks-40

Unit No.	Topic	
Unit-I	Harvesting Machinery	**Reaper windrower:** Vertical conveyor reaper; types of tractor and power tiller operated reaper windrower; Constructional details, parts, functions and adjustments.
Unit-II	Threshing Machinery	**Power threshers**: Types, working principles and constructional details of axial flow threshers; types of threshing cylinders and their adjustments; types of cleaning and grain handling systems and their adjustments.
Unit-III	Combines	**Combines**: Types, constructional details and functions of different sub-assemblies of combine harvester; Adjustments in reel, cutter bar, conveyor, threshing units, separating and cleaning unit, grain augers, bagging units, power transmission mechanism.
Unit-IV	Special Purpose Machinery	**Maize shellers and Groundnut decorticators:** Parts, functions and operation of power operated maize shellers and groundnut decorticators; adjustment of various components for their efficient uses. Common faults and their rectification. Safety and precaution to be followed in operation of maize shellers and groundnut decorticators.

REPAIR AND MAINTENANCE OF POWER DRIVEN FARM MACHINERY (PDFM)

FIRST YEAR

PAPER-II (PRACTICAL)

Marks-60

Unit No.	Topic	
Unit-I	Harvesting Machinery	Identification of different parts of reaper windrower, adjustments of cutter bar, registration and alignment, overload protection safety clutch, operation, care and maintenance. Dismantling, checking, reconditioning, replacement of different components and assembly.
Unit-II	Threshing Machinery	Identification of different components of power operated threshers and axial flow threshers. Dismantling of power thresher, identification of different components, checking of damaged/ worn out parts, their reconditioning, repair and/or replacement and assembly. Adjustments of different components for better threshing and cleaning efficiency, routine maintenance of threshers.
Unit-III	Combines	Identification of different parts and sub-assemblies of combine harvester; Adjustments in reel, cutter bar, conveyor, threshing units, separating and cleaning unit, grain augers, power transmission mechanism.
Unit-IV	Special Purpose Machinery	Maize shellers and Groundnut decorticators: Identification of different parts of power operated maize shellers and groundnut decorticators. Adjustment of various components of maize shellers and groundnut decorticators for their efficient uses. Common faults and their rectification. Safety and precaution in use of maize and groundnut decorticators.

REPAIR AND MAINTENANCE OF POWER DRIVEN FARM MACHINERY (PDFM)

SECOND YEAR
PAPER- III (THEORY)

Marks-40

Unit No.	Topic	
Unit-I	**I C Engine**	Working principle and constructional features of I.C. engine; familiarization with principal parts; principles of operation; difference between two stroke and four stroke engines; engine terminology.
Unit-II	**Fuel and Lubrication system**	Fuel system, major components of fuel system, types of fuel injection system, different parts of injection system. Lubrication system, functions of lubricating systems and their main parts.
Unit-III	**Cooling, Air intake and Exhaust system**	Cooling system: types of cooling system- air cooling, water-cooling and different parts of a cooling system. Different components of an air intake system; intake manifold and their functions, components of an exhaust system; exhaust manifold.
Unit-IV	**Tractors**	Introduction to tractor, Familiarization with various gauges, instruments and controls of tractors, components and different systems of tractor. .

REPAIR AND MAINTENANCE OF POWER DRIVEN FARM MACHINERY (PDFM)
SECOND YEAR
PAPER-III (PRACTICAL)

Marks-60

Unit No.	
Unit-I	Dismantling of engine, Taking measurements of cylinder liner, piston, piston rings, piston pin, small and big end bearings of connecting rod, crank pins; Fitting of liner, piston rings and connecting rod, inserting piston assembly into liner and tightening of big end bearing at required torque; Assembling cam shaft, decarbonising, checking valves and springs, fitting valve guide and valve spring, checking valve seat for leakage, checking and fitting of a rocker arm assembly.
Unit-II	Tightening of cylinder head with proper sequence and torque; replacement of fuel and oil filters, damaged hoses, tightening of clamps, nuts and bolts.
Unit-III	Familiarization with the techniques of crank shaft grinding, honing, pump calibration etc. Checking of fuel and oil pumps for proper functioning and repair and calibration if required.
Unit-IV	Causes and remedies of engine trouble shooting: does not start, irregular performance, smoky exhaust, engine suddenly stops, overheating, low and high oil pressure, Safety and precautions to be taken during engine operation.

REPAIR AND MAINTENANCE OF POWER DRIVEN FARM MACHINERY (PDFM)
SECOND YEAR
PAPER- IV (THEORY)

Marks-40

Unit No.	Topic	
Unit-I	**Power Transmission System of Tractor**	Clutch: its function, types of clutches, various components and working of single and dual clutch systems, Gear box: types of gear boxes, different components, speed ratio. Differential and final drive: principles of operation of differential, functional requirement of final drive, P.T.O. drive
Unit-II	**Steering and Brake System**	Different components of the steering system, types of steering and steering gear boxes used in different tractors. Brakes: functions of a brake system, classification of brakes, working of a hydraulic brake system. Tyres: its size, specification and ply rating, size of rim.
Unit-III	**Hydraulic and Electrical System Tractor**	Function and merits of hydraulic system. Hitching of trailers, Semi-mounted and mounted implements. Electrical system, different components of an electrical system function of storage battery, dynamo, cut-out, starter.
Unit-IV	**Power Tiller**	Importance of power tiller in Indian agriculture, Working principles of power tiller, power transmission, steering, various controls and operational techniques, various uses of power tillers. Rotavators, types of rotavators, parts of rotavator and power transmission.

REPAIR AND MAINTENANCE OF POWER DRIVEN FARM MACHINERY (PDFM)
SECOND YEAR
PAPER-IV (PRACTICAL)

Marks-60

Unit No.	Topic	
Unit-I	**Tractor Systems**	General cleaning, oiling and greasing of tractor, Checking and tightening of nuts and bolts. Checking fuel, oil and cooling systems and battery of tractor. Checking of radiator, hoses etc. and their assembly, Checking and inflating tyres, Starting, running and stopping of engines, observation of different gauges and controls for functioning. Driving practice in forward and reverse direction. Tractor trouble shooting.
Unit-II	**Transmission System**	Study of clutch system of tractor, dismantling, inspection, repair, installation and adjustments of clutch of tractor. Study of gear box of tractor, dismantling, inspection, repair, Study of differential and final drive of tractor.
Unit-III	**Steering , Brake an Electrical System**	Study of steering system of tractor, adjustment of various steering geometry. Study of brake system of tractor and its trouble shooting. Study of hydraulic system of tractor. Study of different components of electrical systems of tractors.
Unit-IV	**Power Tiller**	Dismantling and assembling of major components of power tiller, their adjustments, repair and trouble shooting. Routine maintenance of power tillers. Safety and precautions to be taken before and during operation of power tillers.

Revised Syllabus 2020-21

SERICULTURE

FIRST YEAR

INTRODUCTORY SERICULTURE

Paper - I (Theory)

Marks : 40

Unit - I

Sericulture: its history, importance, origin (3), types of silk worms and their races, voltinism and moultinism (6); systematic position of various silk worms and their geographical distribution (6); salient feature of the silk worms (4)

Unit - II

Mulberry and non-mulberry host plants of different silk worms: Botanical nomenclature, origin and geographical distribution of various host plants (8); Distribution and systematic position of mulberry (1); Mulberry plant morphology – common varieties used in sericulture, their characters, yield and varietal improvement (6); conditions required for mulberry growth (6).

Unit - III

Soil types their suitability; Soil properties and soil pH (6); Functions of essential macro and micronutrients; Sources of nutrients like manures, green manure, vermi-compost, fertilizers, and their composition (6), doses and methods of fertilizer application (4); Organic manures (FYM, compost, tank silt, night soil, sewage sludge, oil cakes, vermicompost) and their application (4).

Unit - IV

Insect pests of mulberry: Sucking insects like jassids, scales, white-flies, mealy bugs leaf eating insects like grasshoppers, hairy caterpillars, cut worms, beetles; internal borers like stem borer; nematodes; their seasonal occurrence, damage symptoms, extent of loss (8); Prophylactic and curative methods of insect pest control (5); Mulberry diseases: Root rot, stem rot, rust, leaf spot, powdery mildew, symptoms of various diseases, types of damage, extent of loss, seasonal occurrence (8); Disease management practices (4); Identification of deficiency symptoms in Mulberry (3); Pesticides and bio-pesticides (4), their formulation (2), various pest control appliances (5).

FIRST YEAR

INTRODUCTORY SERICULTURE

Paper - I (Practical)

Marks : 60

Unit - I

Acquaintance with various silk worms and their races and voltinism, Acquaintance with different food plants of silk worms (Mulberry, Tasar, Muga, Eri) (9); Identification of non-mulberry hosts (9); Study of different morphological traits of silk worm and their life stages (15); Study of various systems of silk worm (15).

Unit - II

Identification of different types of Soils (9); Acquaintance with farm tools and implements, their uses (12); Acquaintance with different fertilizers and calculation of their doses

(9); Method of compost and vermicompost preparation (9); Acquaintance with different plant protection equipments and their safe handling (12).

Unit - III

Identification of different types of weeds (9); Identification of insect pests of Mulberry (12); Identification of leaf, stem and root diseases of Mulberry (12).

Unit - IV

Identification of deficiency symptoms in Mulberry (6); Identification of nematodes (3); Acquaintance with various pesticides and their formulations (12); Acquaintance with bio-pesticides and bio-agents (9); Preparation of spray solutions and dust dilution (9); Preparation of calendar of control measures (9).

FIRST YEAR

INTRODUCTORY SERICULTURE

Paper - II (Theory)

Marks : 40

Unit - I

Cytology and Genetics of Mulberry – Introduction, cell organelles, their function in cell, Cropping pattern- mono, companion cropping, mixed cropping, inter cropping and their uses (6); Influence of Agro-climatic factors on growth and development of mulberry: Edaphic factors – Soils of mulberry gardens, types of soil, profile structure, topography, porosity, aeration, soil water, organic matter and soil micro-organisms (6); Soil reaction – salinity, acidity and alkalinity, soil amendments (5); Climatic factors – Role of light, temperature, wind velocity, altitude, rainfall, relative humidity on growth and development of mulberry (6).

Unit - II

Cultivation and cultural practices: Introduction, garden implements, Package of practices for moriculture (under irrigated and rain fed conditions)(6): Selection of land, land preparation (digging, ploughing, disking, harrowing, leveling, lay out, pit making, bund making, ridge and furrow making) (6); Intercultural operations-weeding, pruning, irrigation and drainage methods and frequency of irrigation (6); Systems of mulberry cultivation (pit, row, paired row and Kolar)(6), Inter cultivation and surface mulching (3).

Unit - III

Nursery preparation: Selection of elite varieties for irrigated and rain fed conditions (6). Propagation of Mulberry- sexual propagation, asexual propagation (3);Selection of planting material (cuttings, saplings, grafts, layers) and their practical utility, planting method, spacing systems and their importance in leaf productivity under different field conditions (6); Biofertilizer: Types (Nitrogen, phosphate, cellulosytic), importance, application and limitation (3).

Unit - IV

Leaf selection and leaf harvesting methods for silk worm rearing, transportation, preservation of leaves, seasonal influence on leaf yield (6);
Estimation of leaf yield – methods of estimation (3);

FIRST YEAR

INTRODUCTORY SERICULTURE

Paper - II (Practical)

Marks : 60

Unit - I

Study of different meteorological factors and their measurement (12); Soil sampling and recording of soil pH and soil moisture (12); Amendment of problematic soil; Water management practices in Mulberry cultivation, Surface irrigation, and Sprinkler and drip irrigation systems (15).

Unit - II

Propagation of mulberry: Selection of materials, preparation of cutting and treatment with root inducing chemicals, planting methods (15); Stem and root grafting (whip and tongue grafting techniques),Budding (patch techniques) (15), Layering (ground and air layering techniques)(9);

Unit - III

Raising of mulberry nursery(12); Transplanting in the field (Rain fed areas) (9); Plantation of cuttings in field (Irrigated conditions) (9); Maintenance – hoeing and weeding (12), fertilizer application (6); Green manuring and inter cultivation – sowing of green manuring crops Dhanicha/ Sanhemp and intercrops like green gram/black gram (12).

Unit - IV

Leaf harvesting- Leaf, branch and shoot harvesting methods in relation to cultivation and rearing practices; Estimation of leaf yield per unit area (acre/hectare) (15). Storage, transportation and preservation methods (12); Estimation of leaf yield; identification of type of leaf, leaf quality determination (12); Pruning methods - types, objectives, methods and practical relevance (15)

SECOND YEAR

REARING AND INDUSTRIAL TECHNOLOGY IN SERICULTURE AND EXTENSION MANAGEMENT

Paper - III (Theory)

Marks : 40

Unit - I

Study on metamorphosis: morphology of egg (external & internal morphology and colour change), larva (mouthparts, legs, prologs, spiracles, eyes, claspers and integumentary hair and sexual markings), pupa (sexual dimorphism – male and female morphology) of mulberry silk worms (9); Environmental requirement for rearing: temperature, humidity, air, light, optimum requirement for different stages, methods of maintenance (3); Rearing house :location & size, types of rearing houses, requirements-orientation-utilization of locally available materials-modifications (3); Rearing (early-& late age) and feeding appliances and their uses (3); Preparation for disinfection: cleaning-washing-drying-disinfection, hygienic rearing. (3)

Unit - II

Silk worm rearing technology (Early age rearing): Characteristics of young age larvae; Commercial races - Multivoltine, bivoltine and hybrid races used in India (6); Collection of disease free layings (DFLs), cards, loose eggs, incubation light-humidity-air-temperature requirement (3); Uniform hatching and brushing methods for 1^{st} instar larvae; Chawki rearing: methods of feeding and rearing of I,II and III instar larvae; advantages and disadvantages (6); Effect of seasons, environmental requirements, feeding schedule, selection of leaf-spacing, cleaning, care during moulting, use of bed disinfectants (6);

Unit - III

Silk worm rearing technology (Late age rearing): Characteristics of late age larvae, rearing methods, advantage, disadvantage (3); Effect of seasons, Environmental requirements, spacing, dusting, cleaning, feeding schedule, care during moulting, leaf requirement, quality and leaf preservation (6); Types of mountages- transfer of matured silk worms, method of mounting, density, care during mounting and spinning of cocoons (6); Harvesting and storage of cocoons: harvesting, cleaning, preservation, assessment of cocoon quality and storage (6);

Unit - IV

Diseases of silk worm- pebrine, bacterial, viral, fungal - causal organisms, mode of infection, symptoms, prevention and control (6); Insect pests of silk worm - Indian Uzi fly and their life cycle, type and extent of damage, control measures (3); Model grainage: basic requirements-plan of grainage; Equipments, Assessment of quality of seed cocoons and their transportation (3); Programming of seeds production: preparation of grainage - sexing-preservation of seed cocoons / pupae-temperature, humidity, light, air requirements (3); Moth emergence, time of emergence, coupling- decoupling, oviposition, moth examination(3). Cellular method and loose eggs, importance of temperature, humidity and light - refrigeration of male moth (3); Concept of CRC organization - community chawki rearing - advantages, disadvantages- care during transportation (3) ;

SECOND YEAR

REARING AND INDUSTRIAL TECHNOLOGY IN SERICULTURE

AND EXTENSION MANAGEMENT

Paper - III (Practical)

Marks : 60

Unit - I

Study of morphology of Mulberry (Bombyx mori), Tasar (Anthaeraea mylitta), Muga (Anthaeraea assama) and Eri (Philosamia ricini) by specimen identification and making labeled sketches of their egg, larva, pupa and moth (12); Dissection of digestive system and silk glands of moth (9);Study of model rearing house-plan (6); Acquaintance with sketching of rearing appliances and their use (9); Disinfectants: identification and preparation for disinfection, disinfection methods, maintenance of hygienic conditions and appliances (9).

Unit - II

Surface sterilization of eggs; Identification of Blue egg stage and black boxing; synchronization- hatching and calculation of hatching percentage(9); Methods of brushing (9); Chawki rearing methods, quality of mulberry leaf, leaf selection (9); Feeding schedules, bed cleaning, spacing, moulting (12); Identification of mountages; Harvesting of cocoons after late worm rearing (3);

Unit - III

Identification of Grainage equipments; Preparation of Disinfectants and Disinfection of Grainage (12); Sex separation of pupa and moths; Synchronization of moth emergence; Coupling, Decoupling and oviposition (6); Moth Examination (method of individual, mass, green, moth examination); Identification of perbrine spores; Sorting and Disinfection of eggs (6); Collection and preservation of *Bombyx mori* life stages (3);

Unit - IV

Identification of parts of Cocoon (3); Cocoon characteristics-Mulberry, eri, tasar and muga. -colour, shape, size, compactness, grains, weight, shell ratio, filament

length, denier, reliability, raw silk percentage, neatness(15); Identification and calculation of good and defective cocoons (6); Defective cocoons, sorting; Cocoon assessment: cocoon weight, shell weight, shell percentage- types of defective cocoons (6); rendita-assessment of cocoon quality in tasar and eri (3);

SECOND YEAR

REARING AND INDUSTRIAL TECHNOLOGY IN SERICULTURE

AND EXTENSION MANAGEMENT

Paper - IV (Theory)

Marks : 40

Unit - I

Raw materials for silk reeling: Selection of cocoon for reeling. assessment of renditta, cocoon gradation, cocoon procurement and transportation (12); Stifling / Drying: objective - various methods of stifling, steam stifling, sun drying , hot air drying- merits and demerits of each method (12); Cocoon sorting and preservation: separation of defective cocoons, deflossing, methods of storing and preservation of coons (9); Ideal conditions for cocoon storage- effect of defective storage- cocoons reelability - storage of hot air dried / steam stifled cocoons (3).

Unit - II

Cooking of cocoons: objectives & principles; various methods of cooking - open pan – three pan– pressurized cocoon cooking - characteristics of water for
cocoon cooking - (9); cocoon brushing (hand and mechanical)(3);. Reeling appliances: Country charkha, Domestic machine, Cottage machine, Multi - end reeling machine, reeling of double cocoons - dupion silk; Re-reeling- objective, lacing, denier, skeining, booking and storage - standard hanks (12);

Unit - III

Collection and preservation of silk waste cooker waste - reeling waste- basin residue – burst open cocoon waste - cleaning of waste- drying- storage of waste

(15); Spinning : raw materials - various forms of silk waste- cocoon waste- degumming- drying- spinning on pedal charkha- drafting- twisting - winding- various processes in spun silk mill- (6); Filature management: organization - planning- costing (3);

Unit - IV

Definition of want, demand, supply, price value, utility, marks demand, elasticity of demand factors responsible for silk production- entrepreneurship (3);
Organization of cooperative sector in sericulture- aims and objectives, cooperative principles, organization of cooperative in rearing, reeling and other areas, Incentives and regulation (3); Management for effective participation in sericulture (3); Marketing- Principles of marketing, costs, defects - regulated markets, merits and demerits of cooperative marketing, stabilization of prices, marketing of cocoon and silk yarn (3); Role of Central Silk Board and Directorate of Sericulture in extension (3).

SECOND YEAR

REARING AND INDUSTRIAL TECHNOLOGY IN SERICULTURE

AND EXTENSION MANAGEMENT

Paper - IV (Practical)

Marks : 60

Unit - I

Identification of defective cocoons and their percentage in a lot, determination of shell ratio of good cocoon (9); Reeling techniques and preparation of cooked cocoons (9); Single cocoon reeling: determination of average filament length, denier and reelability (6); Practical demonstration of cooking, reeling and re-reeling of a sample cocoon (15);

Unit - II

Silk spinning: degumming of waste cocoons, hand spinning on pedal spinning wheel (12); Yarn testing: Denier count and gradation of cocoons and silk (3).

Unit - III

Defination and scope of sericulture- statistics- collection of data sampling - survey- use of

questionnaires, proforma for collection of data- compilation- tabulation, preliminary analysis- report writing (9); Utilization of by-products for dairy, fisheries, gober gas, oil extraction, poultry feed, fuel (6).

Unit - IV

Conducting survey on the role of Govt / C.S.B. and Voluntary organization for development of sericulture, afforestation for development of food plant area in respect of wild silk worm like tasar (12);