Syllabus: Vyapam
For Scientist

ZOOLOGY (2017)

Taxonomy: General characters and classification of Nonchordates and Chordates up to orders.

Physiology in Vertebrates: Physiology of muscle contraction, Digestion, Respiration, Excretion, Osmoregulation. Physiology of heart, cardiac cycle and ECG, Blood, Physiology of nerve impulse, Synaptic transmission, Ear and Eye: structure and function.

Developmental Biology in Vertebrates: Gametogenesis, Fertilization and Parthenogenesis, Development of Frog and Chick up to formation of three germ layers, Embryonic induction, Organizers and Differentiation.

Cytology: Cell: Structure of Prokaryotic and Eukaryotic cell. Cell organelles: Structure and Function of Plasma membrane, Mitochondria, Golgi body, Endoplasmic reticulum, Ribosome, Lysosome and Nucleus, Cell division.

Biochemistry: Structure and metabolism of Protein, lipid & carbohydrates.

Genetics: Structure and function of DNA, RNA and Chromosomes. Varieties of gene expression, Sex linked inheritance, Sex determination, Mutation, Human genetics, chromosomal & single gene disorders, Recombinant DNA & Gene cloning and Protein Synthesis.

Biotechniques: Principles & techniques of Microscopy- Light microscopes, Phase contrast & Electron microscopes, pH meter, Colorimeter, Centrifugation, Separation of biomolecules by chromatography & electrophoresis.

Immunity: Innate and Acquired immunity, B and T lymphocyte, Structure of Antigen and Antibody, Antigen and Antibody reaction, An elementary idea of cell transformation. Cancer and AIDS.

Endocrinology: General Characters of Hormones, Hormone receptor, Structure of Endocrine glands and Biosynthesis of their hormones: Thyroid gland, Pituitary gland, Adrenal gland, Pancreas and Reproductive gland, Endocrine disorder due to hormones, hormonal regulation of gametogenesis, parturition, menstruation, lactation and pregnancy. Extra-embryonic membrane: Structure and function.

Parasitology in relation to human: Protozoa and Dieases, Pathogenic protozoans- Structure and Life Cycle of Entamoeba, Trypanosoma, Plasmodium & Giardia, Pathogenic helminthes, Pathogenic Nematode, Insects as a Vector. Pathogenic microorganisms: Ricketssia, Spirochaetes.

Ecology and Environmental Biology: Ecosystems, Bio-geo chemical cycles, Ecological succession, Population- Characteristics and regulation of densities, Pollution, Wild life Conservation.

Join our WhatsApp Channel for more Model Papers, Answer Keys & Exam Updates
और अधिक मॉडल पेपर, आंसर की व परीक्षा अपडेट के लिए हमारे व्हाट्सएप चैनल से जुड़ें
https://whatsapp.com/channel/0029Vb85NeR90x2yPaPJBU2g
JOIN NOW ▶

Evolution: Evidences in favor of Evolution, Theories of organic evolution (Lamarckism, Darwinism and Synthetic theory of evolution). Variation, Isolation and Natural selection, Man and Horse evolution

Behaviour: Social behavior of honey bee, Reproductive behavior of animals, Prey & Predatory behavior, Imprinting, Conditioning: Classical & Instrumental, Taxes, Reflexes, Drives and Hormones, drugs and behavior.

Toxicology: Classification of toxicants, Principle of systematic toxicology, Toxic agents & their action, Animal poisons- Poisonous & Non-poisonous Snakes, Poison apparatus snake venom, scorpion & bee poisoning, Food poisoning.

Economic Zoology: Sericulture, Apiculture, Fish culture, Prawn Culture, Poultry, Pearl Culture and Vermiculture.

Join our WhatsApp Channel for more Model Papers, Answer Keys & Exam Updates

और अधिक मॉडल पेपर, आंसर की व परीक्षा अपडेट के लिए हमारे व्हाट्सएप चैनल से जुड़ें

https://whatsapp.com/channel/0029Vb85NeR90x2yPaPJBU2g

JOIN NOW ▶

SYLLABUS FOR VYAPAM 2017 FOR THE POST OF SCIENTIST (SUBJECT CHEMISTRY)

Quantum Chemistry

Hydrogen atom, angular momentum. Variational and perturbational methods. Basic of atomic structure, electronic configuration, shapes of orbitals, hydrogen spectrum. Theoretical treatment of atomic structures and chemical bonding. Slatter determinantal wave functions. Term symbol (RS and JJ coupling) and spectroscopic states, term separation energies of p^n and d^n configurations. Virial theorem. Born-Oppenheimer approximation,.

Group Theory

Definition of group, symmetry, point groups, representation of group, orthogonality theorem, irreducible representation, character table, direct sum, direct product, derivation of projection operator. Basic principles and application of spectroscopy- rotational, vibrational, electronic, Raman, ESR, NMR.

Chemical thermodynamics

State of a system, zeroth law, equation of state, Work, heat, first law, Internal energy, expansion work, Enthalpy, Thermochemistry, Second law, Third law, Entropy and the Clausius inequality, Entropy and irreversibility

Classical Thermodynamics

Review of the laws of thermodynamics, free energy, chemical potential and entropies. Partial molar quantities and their significances. Concept and determination of fugacity. Nonideal systems: Excess function for non-ideal solutions. Activity, activity coefficient, Debye-Hückel theory, determination of activity and activity coefficients; ionic strength.

Statistical Thermodynamics

Statistical concepts and examples. Simple random walk problem in one dimension. Statistical ensembles. Basic postulates. Probability calculations. Exact and inexact differentials. Equilibrium conditions and constraints. Reversible and irreversible processes, Maxwell-Boltzman, Photon, BoseEinstein, and Fermi-Dirac statistics. Consequences of Fermi-Dirac equation.

Phase Equillibria.

Phase, degree of freedom, components, Application of phase rule to two and three components system, Gibbs equation Study of phase transitions

Electrochemistry – Nernst equation, electrode kinetics, electrical double layer, Debye-Huckel theory.

Chemical Kinetics- Empirical rate laws. Order, Molecularity, Determination of order of reaction, Arhenius equation, theories of reaction rates, determination of reaction mechanisms, experimental techniques for fast reactions. Concept of catalysis. Polymer chemistry, molecular weights and their determinations. Kinetics of chain polymerization.

Solids – Structural classification of binary and tertiary compounds, diffraction techniques, bonding, thermal, electrical and magnetic properties.

Nuclear chemistry

Nuclear threats, Nuclear explosive devices, Radioactivity, Radioactive decay rates and Half lives, Methods of detection and measurement of radio actives (G.M and Scintillation Counter). Applications of Radioisotopes. Activation analysis: Neutron activation analysis, principle, technique, applications and steps involved in neutron activation analysis. Isotope dilution analysis: Principle, types of isotope dilution analysis, typical applications of isotope dilution analysis.

Surface Chemistry

Adsorption: Surface tension, capillary action, pressure difference across curved surface (Laplace equation), vapour pressure of droplets (Kelvin equation), Gibbs adsorption isotherm, estimation of surface area (BET equation), surface films on liquids (electro-kinetic phenomenon), catalytic activity at surfaces.

Micelles: Surface active agents, classification of surface active agents, micellization, Hydrophobic interaction, Critical Micellar Concentration (CMC), Factors affecting the CMC of Surfaetants, Counter Ion Binding to Micelles,

Join our WhatsApp Channel for more Model Papers, Answer Keys & Exam Updates
और अधिक मॉडल पेपर, आंसर की व परीक्षा अपडेट के लिए हमारे व्हाट्सएप चैनल से जुड़ें
https://whatsapp.com/channel/0029Vb85NeR90x2yPaPJBU2g
JOIN NOW ▶

Thermodynamics of Micellization-Phase Separation and Mass Action Models, Solubilization, Micro Emulsion, Reverse micelles.

Inorganic Chemistry

Chemical Periodicity, Structure and bonding in homo and hetero-nuclear molecules, including shapes of molecules. Concepts of acids and bases. Hybridisation, Types of Chemical bonding. Chemistry of the main group elements and their compounds, allotropy, synthesis, bonding and structure. Chemistry of transition elements and coordination compounds, bonding theories. Spectral and magnetic properties, reaction mechanisms. Inner transition elements-spectra and magnetic properties, analytical application.

Organo-metallic compounds- synthesis, bonding and structure and reactivity. Organo-metallics in homogenous catalysis. Cages and metal clusters.

Role of alkali and alkaline earth metal ions in biology: Na^+ - K^+ Pump, ionophores and crown ethers. Metal site structure, function. Metal ion transport and storage: Ferritin, Transferrin, Siderophores and metallothionein. Electron Transfer: Cytochromes, Iron-Sulfur Proteins and Copper Proteins. Oxygen transport and storage: Hemoglobin, myoglobin, hemerythrin,

Organic Chemistry

IUPAC nomenclature of organic compounds. Principles of stereochemistry, conformational analysis, isomerism and chirality. Reactive intermediates and organic reactions mechanisms. Concepts of aromaticity. Common named reactions. Oxidation and reduction of functional groups. Common reagents (organic, inorganic and organo-metallic in organic synthesis. Chemistry of natural products such as steroids, alkaloids, terpenes, peptides, amino acids and proteins, carbohydrates, nucleic acids and lipids.

Photochemistry

Photochemical Reactions: Interaction of electromagnetic radiation with matter, types of excitations, fate of excited molecule, quantum yield, transfer of excitation energy, actionometry, Photochemistry of carbonyl compounds and aromatic compounds,

Organic Spectroscopy

Physical characterization of organic compounds by IR, UV,MS and NMR, GCMS, and LC-MS. Interdisciplinary topics. Separation techniques, spectroscopic electro and thermoanalytical methods.

Heterocyclic Chemistry

Nomenclature of Heterocycles Replacement and systematic nomenclature (Hantzsch - Widman system) for monocyclic, fused and bridged heterocycles.

Join our WhatsApp Channel for more Model Papers, Answer Keys & Exam Updates

और अधिक मॉडल पेपर, आंसर की व परीक्षा अपडेट के लिए हमारे व्हाट्सएप चैनल से जुड़ें

https://whatsapp.com/channel/0029Vb85NeR90x2yPaPJBU2g

JOIN NOW ▶

Syllabus for Scientist - 2017 (Physics)

1. Scalars and Vectors, Laws of Motion, Kepler's laws. Gravitational law, Conservation of linear momentum, angular momentum and energy. Conservation Laws and Simple Harmonic Oscillations, Elasticity, Viscosity, Surface Tension,

2. Columb's law in vacuum expressed in Vector forms calculations of E for simple distributions of charges at rest, dipole, Gauss's law and its application, capacitors Dielectric and conductors

3. Kirchoff's law, AC and DC circuits, Lorentz force equation and definition of B, Biot and Savart's law, its applications; Ampere theorem, Electromagnetic induction, Faraday's law, transformer

4. Thermodynamics , Maxwell's equation, Black body radiation, Optics – reflection, refraction interference and diffraction.

5. Wave-particle duality, Hydrogen atom, phase space, micro and macro states, Schroedinger's wave equation, eigen values problem, tunneling through a barrier, wave function, Uncertainty principle, photoelectric effect, Radioactivity, fission fusion,

6. Semiconductor, diode, transistor, ICs, Digital, Number Systems, Logic gates, Counters, Operational amplifier, Fibre Optics

Join our WhatsApp Channel for more Model Papers, Answer Keys & Exam Updates
और अधिक मॉडल पेपर, आंसर की व परीक्षा अपडेट के लिए हमारे व्हाट्सएप चैनल से जुड़ें
https://whatsapp.com/channel/0029Vb85NeR90x2yPaPJBU2g
JOIN NOW ▶

CHHATTISGARH ENVIRONMENTAL CONSERVATION BOARD
SYLLABUS FOR SCIENTISTS RECRUITMENT BOTANY

CYTOLOGY
Microscopy and Techniques in cell biology. Structural organization of the plant cell, Structure and functions of Cell wall, Plasma membrane and Cell organelles, chromatin organization, Cell division, Apoptosis,

GENETICS
Mendelism, Linkage, Crossing over, Gene mapping, Allien gene transfer , genetic basis of breeding and heterosis, exploitation of hybrid vigour.

MOLECULAR BIOLOGY
RNA structure, DNA Structure, replication, damage and repair, transcription and Translation. RNA splicing, regulation of gene expression ,protein sorting. Nuclear DNA content, restriction mapping , micro dissection ,micro cloning and karyotype analysis. Mutation, transposable elements, inherited human diseases and defects in DNA repair, translocation.

MICROBIOLOGY
Archaebacteria and Eubacteria : General account, ultra structure, nutrition , reproduction and economic importance.

Cyanobacteria: Structure ,reproduction and biological importance.

Viruses : Characteristics and ultra structure, replication, transmission of viruses and economic importance.

Phytoplasma : General characteristic and role in causing plant diseases.

Phycology : Algae in diversified habitats ,thallus organization, reproduction ,Classification and Economic importance .

Mycology : General characters of fungi, Classification, structure and reproduction, heterothallism, Para sexuality, Mycorrhiza, fungi as biocontrol agent.

Bryophyta : morphology, structure, reproduction, life history, distribution, classification, Economic and ecological importance.

Pteridophyta : morphology, anatomy, reproduction, classification, and evolution of stele. Heterospory and origin of seed habit, general account of fossil pteridophytes .

Gymnosperm: General characters of gymnosperm,
Classification, Resemblances , distribution in India. Gymnosperm. Biotechnology. Economic importance of gymnosperm.

TAXONOMY
Plant nomenclature ,Plant identification ,Taxonomic hierarchy, Taxonomic evidences ,Geographical information system (GIS). Classification systems, Fossil angiosperm.

Study of families with particular reference to systematic position, phylogeny, evolutionary trends and economic importance of Dicot families like Ranunculaceae, Magnoliaceae, Nymphacaceae, Capparidiceae, Sterculiaceae, Meliaceae, Fabaceae, Cucurbitaceae, Umbelliferae, Asteraceae, Sapotaceae. Bignoniaceae, Labiatae, Verbenaceae, Euphorbiaceae, Moraceae, Monocot families like Orchidaceae, Zingiberaceae, Commelinaceae, Cyperaceae, Poaceae.

Join our WhatsApp Channel for more Model Papers, Answer Keys & Exam Updates
और अधिक मॉडल पेपर, आंसर की व परीक्षा अपडेट के लिए हमारे व्हाट्सएप चैनल से जुड़ें
https://whatsapp.com/channel/0029Vb85NeR90x2yPaPJBU2g
JOIN NOW ▶

PLANT PHYSIOLOGY

Membrane transport and translocation of water and solutes, Signal Transduction :Overview, Stress physiology ,Fundamentals of enzymology Sensory photobiology, Photosynthesis, Respiration and Lipid metabolism , Nitrogen and Sulphur metabolism.

Plant growth regulators and elicitors , Physiological effects and mechanism of action ,The flowering process:- Photoperiodism, vernalization. , Seed germination, Seed dormancy, Senescence,.

ANATOMY

Root development, Shoot development, Leaf development, Phyllotaxy, Flower development , Anatomy of Root, stem and leaf.

EMBRYOLOGY: Microsporangium, Microsporogenesis, Male gametophyte, Megasporangium, Megasporogenesis, Female gametophyte, Pollination, Pollen stigma interaction, Self-incompatibility, Fertilization, double fertilization, *in-vitro* fertilization. Seed and Fruit development .

ECONOMIC BOTANY : Origin, Evolution, Cultivation and Uses of (i) Food, Forage and Fodder crops, (ii) Fiber crops, (iii) Medicinal and Aromatic plants, (iv) Vegetable Oil-yielding crops. Important fire-wood, Timber-yielding plants and Non-wood forest products (NEFPs) .

ECOLOGY

Ecosystem, Structure and functions, primary production, energy flow pathways, global biogeochemical cycles , Ecological perturbations , plant invasion, environment impact assessment, ecosystem restorations. Concept of Sustainable development, Concepts of community and analysis of communities, concept of ecological niche. Temporal changes (cyclic and non cyclic), mechanism of ecological succession. Major vegetation types and soil types of the world. Pollution and Climate change. Biodiversity, IUCN categories of threat, Principles of conservation, and extinctions,

BIOTECHNOLOGY

Recombinant D.N.A. Technology, Microbial genetic manipulation, Genetic engineering of plants, DNA Synthesis and DNA finger printing. Genomics and Proteomics._Genome projects, bioinformatics, functional genomics, microarrays, protein profiling.

Plant cell and Tissue culture: Applications of cell culture, Clonal propagation, Organogenesis, Androgenesis, Somatic hybridization, Cryo preservation and germplasm storage, Intellectual property rights. Production of secondary metabolites, Transgenics in plant improvement.

PLANT PATHOLOGY

Classification of plant diseases. Disease Symptoms of plant diseases ,Sources of Infection ,Pathogenesis .Effect of environment on disease development, Host Parasites relationship, Physiological specialization ,Defense Mechanism, Resistance and susceptibility ,Epidemiology and disease forecasting , General principles of plant disease control , Common diseases of fungi, bacteria, Viruses ,Mycoplasma and Nematodes.

.....

Join our WhatsApp Channel for more Model Papers, Answer Keys & Exam Updates
और अधिक मॉडल पेपर, आंसर की व परीक्षा अपडेट के लिए हमारे व्हाट्सएप चैनल से जुड़ें
https://whatsapp.com/channel/0029Vb85NeR90x2yPaPJBU2g
JOIN NOW ▶

Syllabus (Environmental Sciences) for Scientist Vyapam 2017

The Environment: Physical environment; biotic environment; biotic and abiotic interactions.

Atmospheric chemistry, Aquatic chemistry, Soil Chemistry

Habitat and Niche: Concept of habitat and niche; niche width and overlap; fundamental and realized niche; resource partitioning; character displacement.

Population Ecology: Characteristics of a population; population growth curves; population regulation; life history strategies (r and K selection); concept of metapopulation – demes and dispersal, interdemic extinctions, age structured populations.

Species Interactions: Types of interactions, interspecific competition, herbivory, carnivory, pollination, symbiosis.

Community Ecology: Nature of communities; community structure and attributes; levels of species diversity and its measurement; edges and ecotones.

Ecological Succession: Types; mechanisms; changes involved in succession; concept of climax.

Ecosystem Ecology: Ecosystem structure; ecosystem function; energy flow and mineral cycling (C,N,P); primary production and decomposition; structure and function of some Indian ecosystems: terrestrial (forest, grassland) and aquatic (fresh water, marine, eustarine).

Biogeography: Major terrestrial biomes; theory of island biogeography; biogeographical zones of India.

Applied Ecology: Environmental pollution; (Air pollution, Water Pollution, Soil Pollution and Sound Pollution) Global environmental change;

Biodiversity: status, monitoring and documentation; major drivers of biodiversity change; biodiversity management approaches.

Conservation Biology: Principles of conservation, major approaches to management, Indian case studies on conservation/management strategy (Project Tiger, Biosphere reserves).

Basic elements and tools of statistical analysis- mean, median, mode, range & standard deviation, confidence interval of the mean, sampling, probability, measurement and distribution of attributes, Distribution – Normal, t and chi square, Poisson and Binomial, Types of errors, accuracy and precision, rounding off, significant figures, normal distribution of errors, standard error of a mean, test of significance, t-test, ANOVA one way and two way classification.

Join our WhatsApp Channel for more Model Papers, Answer Keys & Exam Updates
और अधिक मॉडल पेपर, आंसर की व परीक्षा अपडेट के लिए हमारे व्हाट्सएप चैनल से जुड़ें
https://whatsapp.com/channel/0029Vb85NeR90x2yPaPJBU2g
JOIN NOW ▶