

Cost of Application Form:

General & OBC Candidates: 1500/-

ST/SC Candidates: 750/-

ENTRANCE TEST (PAT/PHT/PUT & B.N.Y.S. - 2014)

Syllabus



The Coordinator (PAT/PHT/PUT & B.N.Y.S. – 2014)

Dr. S R Rajasthan Ayurved University

Office: Kadwad, Nagaur Road,

JODHPUR (Raj.) - 342037.

Examination Information

Date Of Examination:

18-June-2014, Wednesday

Time: 08:00am to 11:00am.

Physics (50 Question),
Zoology (50 Question)
Chemistry (50 Question)
Botany (50 Question)

IMPORTANT NOTE :-

All Candidates must submit their all original documents during counseling otherwise he/she will not be permitted for counseling.

Important Information

The Examination Centres will be located in the cities:

Jodhpur, Jaipur, Udaipur, Ajmer, Bikaner, Kota, Sriganganagar & New Delhi.

SALIENT FEATURES

1. One Paper Scheme.
2. Computerized examination cum application form.
3. Separate choice is not required for PAT/PHT/PUT & B.N.Y.S.
4. Answer sheets shall be OMR type, in triplicate and answers to be marked by blue / black ink ball point pen only.
5. Standard Answer key shall be sent to candidates with their mark sheets.

Online Registration will be available from 25 /04/2014 (Friday) to 14/05/2014 (Wednesday) Up to 5.00 pm. After /05/2014 (Up to 5.00 pm.) Online Registration will not be accepted. No need to send filled copy of downloaded online registration form (hard copy) to this office. Keep it with you for further reference.

Office Hours : 10.00 am to 5.00 pm on all working days.

Phone No. : 0291-5153715/732

Web Site: www.raujodhpur.org

Web Site: www.dsrrau.org

Physics

(M. K. S. rationalized system of units to be used)

UNIT 1

Dynamics of Rigid Bodies: Rotation of a rigid body, Torque, angular acceleration, angular momentum, moment of inertia, kinetic energy of rotation, M.I. of ring, statement of theorems of

UNIT 2

Surface Tension : Definition, angle of contact, capillarity, pressure difference across a spherical film. Determination of surface tension by capillary rise and Jaeger's methods.

Gravitation: Newton's law of gravitation, gravitational constants

Motion: Displacement, velocity and acceleration. Their graphical and mathematical representations.

UNIT 3

Kinetic Theory of Gases: Postulates of kinetic theory, derivation of pressure of a gas, interpretation of temperature .

Vanderwall's equation. First Law of Thermodynamics: isothermal, isobaric and Dependent isometric (constant volume) processes, specific heat of a gas Stefan's Law, Newton's Law of cooling, Black body spectrum, Wien's Law

UNIT 4

Nature of Light: Light as wave motion, plane and spherical wavefronts, plane surface, Elementary idea of electromagnetic nature of light waves, quantum nature of light. Superposition of Waves:

Beats, interference, stationary waves in strings and pipes. Doppler's Principle: light waves.

UNIT 5

Interference: Coherent Sources, Fresnel's biprism. Diffraction: obstacle for plane wave on axial points. Rectilinear propagation of light, Zone plate. X-Ray : Production-Collidge tube, X-

Ray spectra, characteristic X-Ray, uses of X-Ray, Radiation hazards (biological effect law and its application to the field of uniformly charged spherical conductor, Electric potential and field potential at a point

due to an electric dipole, dipole moment. Bio-Savart's Law : Statement and application the axis of a circular coil carrying current.

UNIT 6

Electrostatics: Fundamental forces of nature (gravitational, electromagnetic and nuclear), conservation and quantisation of charges.

Coulomb's law (vector notation), superposition parallel and perpendicular axes and their simple applications. Compound pendulum as a rigid oscillating body and its time period.

Conservation Laws : Conservation of energy, momentum and angular momentum. Applications of conservation laws.

UNIT 7

Potentiometer: Principle and its application to (i) measurement of potential difference, (ii) internal resistance of a cell, (iii) calibration of voltmeter and ammeter. Electromagnetic Induction: electromagnetic induction, rotating coil in a magnetic field, alternating current, transformers, long distance transmission of power, dynamo and motors.

UNIT 8

Alternating Currents : R.M.S. and peak values of current and voltage, Phase relationship between voltage and current in a resistor, inductor and in a capacitor in parallel and in series combinations. Definition of impedance and reactance, expressions for instantaneous and average power in A.C. circuits (No derivations), Power factor, wattless current and Chock coil.

UNIT 9

Positive Ray Analysis: Positive rays, Thomson and Boinbridge mass spectrometer, Isotopes. Atomic theory of hydrogen spectrum and its shortcomings. quantum numbers (total, orbital) and exclusion principle, electron configuration in atoms. Matter Waves: De Broglie hypothesis, Davisson and Germer

Experiment. explanation of Bohr's orbits. Radioactivity : Characteristics of alpha, beta and gamma rays, Laws of disintegration, half and mean lives, radioisotopes and their uses.

UNIT 10

Magnetic Properties of Matter : Permeability, susceptibility, intensity of magnetisation and relation amongst them. Dia, para and ferromagnetic substances and their behaviour in magnetic field. Electronics: Thermionic emission, work function. characteristics of a diode, use of diode as a half and full wave rectifier, power supply, use of Triode, static characteristics and parameters, Triode as an amplifier, Semi-conductors and insulators, energy bands in solids (descriptive idea only), energy gap in insulators, intrinsic and extrinsic semi-conductors (p-type and n-type). PN Junction. Forward and Reverse bias characteristics.

Chemistry

UNIT 1

Development of Classical Model of an Atom: Bohr model of an atom, quantisation of electronic energy, d-Block Elements : General characteristics, Elementary idea about paramagnetism and

diamagnetism, different oxidation states of elements, Spectral evidence for quantisation, Introductory concept of four quantum numbers, Pauli's exclusion principle, concept of the spatial distribution of s, p and d orbitals. Aufbau Principle, The Periodic Law: Long form of the Periodic Table, Electronic configuration and the Periodic Table, Periodicity in Properties, Elementary ideas about ionisation potential, electron affinity, electronegativity and atomic radius.

UNIT 2

Theory of Chemical Bonding : The ionic bond, characteristic properties of ionic compounds. The covalent bond, characteristic properties of covalent compounds, Introductory concept of overlapping of orbitals and σ and π bonds, Coordinate bond, Oxidation number, Hybridisation as illustrated by common molecules like : NH_3 , H_2O , CH_4 , C_2H_4 and C_2H_2

UNIT 3

Chemical Equilibrium and Ionic Equilibria: Generalised expression of law of mass action; experimental method for verification of mass law, application to systems as $\text{N}_2 + 3\text{H}_2 = 2\text{NH}_3$; $\text{PCl}_5 = \text{PCl}_3 + \text{Cl}_2$; $\text{N}_2 + \text{O}_2 = 2\text{NO}$
Ionic Equilibria: Arrhenius theory, evidence in favour of dissociation theory, ionic product of water, hydrolysis, relation between hydrolysis constant; ionic product of water and dissociation constant; solubility product and its applications to analytical chemistry.

UNIT 4

Acids and Bases: Hydrogen and hydroxyl ions in aqueous solution, Lewis concept of acids and bases. Theory of indicators for acid, alkali titrations, choice of indicators. Oxidation Reduction, ion electron concept. Balancing of equations by ion electron method.

UNIT 5

Metals: Nature of metallic bond. Occurrence of metals in nature General principles of metallurgy as illustrated by method used for the extraction of iron, copper, aluminium and silver from various types of ores.

s-Block Elements : General characteristics, Trends in variation of properties in periodic table of alkali and alkaline earth metals. transition elements as illustrated by chromium, manganese and iron.

UNIT 6

Classification of organic compounds, Nomenclature. Homologous series, Functional groups: Isomerism (Position, chain, functional metamerism). Preparation, Properties and uses of Benzene (structure elucidation excluded). Nitrobenzene. aniline and phenol.

UNIT 7

General method of preparation, properties and uses of alkanes (upto 5 carbon atoms). Isomerism of butanes and pentanes, Substitution reaction (free radical mechanism). Alkenes :General methods of preparation, properties and uses of Ethylene,

Electrophilic addition (mechanism). Markownikoff's rule, per properties and uses, Acetylene: Addition reaction Polymerization.

UNIT 8

General methods of preparation, properties and uses of mono, di and tri-halogen derivatives, (excluding unsaturated, upto 2 carbon atoms, Haloform reaction, synthetic uses of alkyl halides , Polarity of carbon-halogen bond : Elementary concept of nucleophilic substitution. General methods of preparation, properties and uses of the alcohols with reference to methyl and ethyl alcohol : Absolute alcohol and power alcohol, Fermentation.

UNIT 9

General methods of preparation, properties and uses of ether with reference to diethylether. General methods of preparation, properties and uses of aldehydes and ketones with reference to formaldehyde, acetaldehyde and acetone. Polymerization and condensation reaction (No Mechanism). Similarity and distinction between aldehydes and ketones, idea of mechanism of nucleophilic addition to carbonyl groups.

UNIT 10

General methods of preparation, properties and uses of monocarboxylic acids with reference to formic and acetic acids. Derivative of fatty acids; acetyl chloride, acetamide, acetic anhydride and ethylacetate. General methods of preparation, properties and uses of aliphatic amines with reference to methyl and ethylamines, Urea.

Biology

UNIT 1

Diagnostic characters of the major plant groups: prokaryota, Eucaryota- Thallophyta (Algae, Fungi), Bryophyta, Pteridophyta, Spermatophyta (Gymnosperms and Angiosperms); main branches of Botany.

UNIT 2

Mendel's laws of inheritance, physical and chemical: Incomplete properties; structure and chief functions of the main organelles cell cycle, mitosis, meiosis, structure and chemistry of chromosomes.

UNIT 3

Mendel's laws of inheritance : -cross; Incomplete monohybrid and dihybrid dominance, ratios. test cr

UNIT 4

Primary structure and normal secondary growth in dicot root and stem and primary structure in monocot root and stem; internal structure of isobilateral and dorsiventral leaves.

UNIT 5

Lower Plant : Distribution, structure; life-history and systematic position of the following taxa :

1. Viruses, Mycoplasma and Bacteria a general account
2. Algae : Ulothrix
3. Fungi : Albugo
4. Bryophyta : Riccia
5. Pteridophyta : Pteridium

UNIT 6

Higher : Life history of Capsella.

Medical Plant : Medicine obtained, their uses, plant parts from which they are obtained in the following plants: Rauwolfia serpentina, Curcuma longa, papaver somniferum, Ferula asafoetida and Cinchona officinalis.

UNIT 7

Diagnostic characteristics, generalized floral diagrams and formulae and 5-10, economically important plants of the following families : Cruciferae, Malvaceae, Leguminosae, Solanaceae and Liliaceae.

UNIT 8

Aims and scope of ecology : Ecosystem concept : plant adaptation, hydrophytes, halophytes xerophytes and mesophytes.

UNIT 9

Elementary principles of plant physiology-I : Osmosis, Absorption of water passive and active : ascent of sap transpiration and guttation,
Photosynthesis : Mechanism and main factors affecting it

UNIT 10

Elementary principles of plant physiology- II: Osmosis respiration-types : fermentation, respiratory quotient glycolysis (EMP pathway) ; Krebs cycle (main step only), oxidative phosphorylation; factors effecting respiration, fermentation, growth hormones; plant movements.

Zoology

UNIT 1

Protoplasm : Inorganic constituents, Organic, constituents (carbohydrates, liquids, proteins, nucleic acids).

UNIT 2

Ultra structure of a typical animal cell. Functions of cell organells, Cell division : mitosis and meiosis. Glycolysis and Krebs cycle.

UNIT 3

Habits, habitat, structure and life processes of Amoeba. Habitat, habits and structure of plasmodium including life cycle.

UNIT 4

Habits, habitat, structure and life cycle of Hydra and Ascaris.

UNIT 5

Habits, habitat, structure and life processes of Pheretima and Periplaneta.

UNIT 6

Development Biology : (a) Basic features of Development in animals, formation of gametes, structure of ovum, type of eggs, examples of insect, frog, chick and Mammalian eggs; structure of sperm; fertilization; cleavage and significance; types of gastrulation, significance of gastrulation.

UNIT 7

Anatomy, history and Physiology of the following in Rabbit :

1. Integumentary system
2. Digestive system
3. Respiratory system
4. Circulatory system
5. Musculature of limbs

UNIT 8

Anatomy and physiology of the following in rabbit

11. Excretory system
12. Reproductive system
13. Elementary idea of different endocrine glands.
14. Receptor organs (eye and ear)
15. Nervous system: Central nervous system (Brain and spinal cord), Peripheral nervous system (Cranial and spinal nerves), autonomic nervous system.

UNIT 9

Classification of animal Kingdom, mentioning only the general characteristics of the following phyla and classes with example (avoid details) : Non-Chordata :

18. Protozoa Sarcodina Flagellata, Sporozoa, Ciliata.
19. Porifera Calcaria, Hexactinellida, Demospongia.
20. Coelenterata Hydrozoa, Sypeozoa, Actinozoa.
21. Platyhelminthes Turbellaria, Trematoda, Cestoda.
22. Anneliaba Oligochacta, Arachinda, Myriopoda, Insecta.
23. Ecoinodermata Asteroidea, Crinoidea.
2. Mollusca Bivalvia, Gastropoda, Cephalopoda.
3. Minorphyla Ctenophora.

UNIT 10

General characters of the phylum Chordata and classification upto classes with Characters and examples (avoid details)

- (a) Protochordata Hemi, Uro and Cephalo Chordata.
- (b) Pisces Elasmobranchiil and Teleosts.
- (c) Amphibia
- (d) Reptilia
- (e) Aves

Mammalia