उत्तराखण्ड अधीनस्थ सेवा चयन आयोग,

थानों रोड, रायपुर, देहरादून।

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Syllabus for the Post Advertised in Advertisement No. 43/UKSSSC/2022 dated 03-01-2022 के संदर्भ में:–

विज्ञापन संख्या 43/UKSSSC/2022 दिनांक 03-01-2022 में विज्ञापित पद क्रमांक (3) पदनाम– अग्निशमन द्वितीय अधिकारी (पुरूष/महिला) पद कोड– 024/648/43/2021 के चयन हेतु 100 अंकों की वस्तुनिष्ठ प्रकार (Objective type with Multiple Choice) की 02 घंटे की एक लिखित परीक्षा होगी। लिखित परीक्षा हेतु पाठ्यक्रम निम्नवत निर्धारित है–

1) भौतिक विज्ञान
2) रसायन विज्ञान
3) जीव विज्ञान (जन्तु विज्ञान/वनस्पति विज्ञान)

पाठ्यक्रम आयोग की वेबसाइट पर प्रकाशित है।

8/2/22

(संतोष बडोनी)
सचिव।

Syllabus for the post of Fire Station Second Officer (S.l.No-03) Vide advertisement No.-43/UKSSSC/2022/ Dated- 03-01-22

PHYSICS

Unit 1:-Fundamental Physics

Dimension of Physical quantities. Scalar and Vector quantities and their applications. Equation of motions. Different Kinds of motions. Law's of motion and its application. Friction.Work, Energy, Power, Conservation of energy, Linear and Angular Momentum. Centre of Mass, Law's of planter motion, moment of inertia of rigid body.Force and Momentum. Gravitation

Unit 2:- properties of matter

Hooke's law, mechanical property of matter, Viscosity, Fluid pressure,Bernaulli's theorem and its application, Surface Tension, Crystal structure of solid, Law's of thermodynamics, heat engine, heat transfer, entropy, kinetic theory of gases, Specific heat, para-dia-ferro magnetic substances with examples.

Unit 3:- Electricity and Magnetism

Charges, coulomb's law, electric field lines, electric field intensity, electric dipole and moment, gauss's theorem and its application, conductors and insulators, capacitors, electric potentials , electric current, drift velocity, ohm's law, electrical resistance and colour code for resistor, internal resistance of cell, Kirchhoff's laws and its application, whetstone's bridge. Biot- savart's law and its application, ampere's law, galvanometer and its conversion to ammeter and voltmeter, magnetic flux, electro-magnetic induction, Faraday's law, Lenz's law, eddy current, self and mutual induction, alternating current, LCR circuits, resonance, wattless current, power and ac generator and transformer.

Unit 4:- Wave and Optics

Simple harmonic motion (SHM) and its equation, longitudinal and transverse waves, Beats, Doppler effects, simple pendulum, speed of wave motion, principal of superposition of waves, application of ultrasonic waves. Reflection of light, refraction, total internal reflection and its application, optical instruments- microscope, telescope, Human eye, Huygens' principle, Diffraction, Polarization, Interferences, Dispersion and Scattering of light.

Unit 5:- Modern Physics

Structure of atom, Hydrogen-atom spectrum, nuclear properties, dual nature of radiation, Photo electric effects, wave length of matter waves, radioactivity, nuclear fission, nuclear fusion, mass-energy equation. Electromagnetic wave and its applications, semiconductors, semiconductor diode, rectification, Zener diode as a voltage regulator, transistor and its application (amplification, switch, oscillators), Logic Gates (OR, AND, NOT, NAND, NOR).

Current general knowledge and current scientific advancement in above mention topics.

CHEMISTRY

Unit-1:Basic concepts of chemistry: Dalton's atomic theory, Concepts of elements, Atoms and molecules. Atomic and molecular mass, Mole concept and molar mass, Percentage composition, Empirical and molecular formula, Chemical reactions.

Structure of atom: Discovery of electron, Proton and neutron, Rutherford's model and its limitations, Bohr's model and its limitations, Dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle. Orbitals and quantum numbers, Aufbau principle, Pauli Exclusion Principle, Hund's Rule.

Unit -2:Chemical bonding and molecular structure: Ionic bonding, Covalent bond, Valance bond theory, Molecular orbital theory, VSEPR theory, Concept of hybridization, Hydrogen bond.

Redox reactions: Concept of oxidation and reduction, Oxidation number, Balancing redox reactions

Unit- 3 :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, Electron gain enthalpy, Electronegativity, Ionization Potential.

General principle and processes of isolation of elements: Copper, Aluminum, Zinc, Iron.

Coordination compound: Nomenclature, Isomerism, Bonding in coordination compound, Werner's Theory, Valence bond Theory, Crystal Field Theory.

Solid State: Molecular, Ionic, Covalent and metallic solids, Unit cell and its type, Point defects, Electrical and Magnetic properties.

Unit- 4:Thermodynamics: System and its type, Work, Heat, Energy, Extensive and Intensive properties, State function. First law of thermodynamics-Internal Energy and enthalpy, heat capacity and specific heat, Hess's law of constant, heat summation. Enthalpy of bond dissociation, combustion, formation, atomization, sublimation , Introduction of entropy as a state function, Free energy change, Spontaneous and non-spontaneous processes.

Chemical Kinetics: Rate of reaction, Catalyst, Order and molecularity of a reaction, Rate law and specific rate constant, Concept of collision theory, Activation Energy, Arrehenius Equation.

Solutions: Types of solutions, Expression of concentration of solution of solids in liquids, solubility of gases in liquids Colligative properties; relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, Van't Hoff factor.

Electrochemistry: Electrolytic conductance, Kohlrausch's law, law of electrolysis, Electrolytic cell and galvanic cell, EMF of a cell, Standard electro potential, Nernst equation, Corrosion, Fuel Cell.

Unit- 5:Organic chemistry: Some basic principle and techniques; Classification and IUPAC nomenclature of organic compounds, Inductive effect, Electromericeffect,Resonance , Hyperconjugation, Homolytic and heterolytic fission of covalent bond: free radicals, carbocations, carbanions; electrophiles and nucleophiles; Types of organic reactions.

Hydrocarbons: Classification of hydrocarbons, Alkanes, Alkenes, Alkynes: Nomenclature, isomerism, Physical properties, and Chemical reactions. Aromatic Hydrocarbons: IUPAC nomenclature, Physical and chemical properties: mechanism of electrophilic substitution – nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation; carcinogenicity and toxicity.

Polymers: Classification, Natural and synthetic polymers, methods of polymerization (addition & condensation), Copolymerization, Some important polymers, Polythene, Nylon, Polyesters, Bakelite, Rubber.

Chemistry in Everyday Life: Chemicals in medicines, food and cleansing agents.

Current general knowledge and current scientific advancement in above mention topics.

BIOLOGY

UNIT-I

- Cell theory. Cell wall. Cell membrane and cell organelles. Cell cycle (Mitosis and Meiosis).
- Proteins. Carbohydrates. Lipids. Enzymes (Properties, classification and functions).
- Nucleic acids. DNA replication. Genetic code.Protein synthesis. Gene expression and regulation.
- Biotechnology and its applications. DNA fingerprinting, Transgenics (animal and plant).

UNIT-II

- Origin of life. Theories of organic evolution.Adaptation and adaptive radiations. Evolution of man. Hardy- Weinberg principle.
- Mendelian laws of inheritance. Gene interaction. Incomplete dominance. Sex determination. Linkage and crossing over. Sex-linked inheritance and chromosomal disorders.

UNIT-III

- Ecosystem ecology. Food-chain and Food-web, Energy flow. Population dynamics. Pollution.
- Biodiversity and conservations measures.
- Microbes and human welfare. Biofertilizers. Sewage treatment.Immunology. Vaccines. Cancer. AIDS. Contraceptives and STD.
- Pathogen and parasites. Insect- Pest management.
- Botanical gardens. Herbaria. Zoological parks and museums.

UNIT-IV

- Principles of taxonomy. Codes of nomenclature.
- Plant diversity. Major groups and their classification.
- Plant tissue. Morphology, Anatomy and function of different parts of flowering plants (Root, Stem, Leaf, Inflorescence, Flowers).
- Water mineral nutrition in plants. Respiration. Photosynthesis. Growth and development.
- Asexual and sexual reproduction in plants. Sexual reproduction in flowering plants. Pollination. Fertilization. Apomixes. Development of fruits and seeds and their dispersal.Polyembryony.
- Plant breeding. Single cell protein.

UNIT-V

- Animal diversity. Major groups and classifications (Upto classes in case of invertebrates and upto orders in case of vertebrates).
- Animal tissues.
- Morphology and anatomy of animals like Earthworms, Cockroach and Frog.
- Human anatomy of physiology with special reference to Digestive system, reproductive system, circulatory system, excretory system, locomotion and movement, neural controls and coordination, endocrine glands and hormonal functions.
- Human Reproduction. Reproductive system in male and female. Menstrual cycle. Production of gametes. Fertilization. Implantation. Embryo development. Pregnancy. Parturition an lactation.

Current general knowledge and current scientific advancement in above mention topics.