PROPOSED SYLLABUS FOR DIP ENTRANCE EXAM AS PER REVISED EDUCATIONAL QR

ENGLISH

The question paper in English is designed to test the candidate's understanding of English and practical daily usage of words for communication. The question paper covers the areas of reading skills and writing skills including vocabulary and grammar usage.

2. **Reading Skills**

(a) Multiple choice questions based on discursive passage of 400-500 words to test inference, eval and vocabulary.

(b) Multiple choice questions based on case based factual passage of 300-350 words with statistical data, chart etc to test analysis and interpretation.

3. **Writing Skills: Grammar**-

(a) **Parts of Speech**
- (i) Article.
- (ii) Noun and pronoun.
- (iii) Adjective.
- (iv) Preposition.
- (v) Conjunction and modals.

(b) **Verbs**
- (i) Tenses.
- (ii) Present / past forms.
- (iii) Simple/continuous form.
- (iv) Perfect form.
- (v) Future time reference.

(c) **Sentence Structure**
- (i) Type of sentences.
- (ii) Affirmative/interrogative sentence.
- (iii) Use of phrases.
- (iv) Direct/indirect speech.
- (v) Active and passive voice.

(d) **Other Aspects**
- (i) Idioms and phrases.
- (ii) Synonyms and antonyms.
- (iii) One word substitutions.

(e) Writing a formal letter based on a given situation (100-120 words).

(f) Writing an analytical paragraph based on given map/chart/report/graph (100-120 words).

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Lt Col A K Sharma

(d) Electric Bell

(e) Fleming's left hand rule

(f) Fleming's right hand rule

(g) Electric generator (AC and DC).

(h) Electric motor.

(j) Domestic Electric Circuits. Accidents caused by Electricity, safety devices.

9 Natural Resources

(a) Conventional and non conventional sources of energy with examples.

(b) Renewable and non renewable sources of energy with examples.

(c) Nuclear energy.

(d) Role of atmosphere in climate control.

(e) Air flow at day and night, causes of rain and means of pollution.

(f) Biochemical cycles: water cycle, nitrogen cycle, carbon cycle, oxygen cycle, greenhouse effect.

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(Presiding Officer)

Dr S Datta, Prof

PROPOSED SYLLABUS FOR DIPLOMA ENTRANCE TEST CHEMISTRY

Unit 1 Matter-Nature and Behaviour.

1.1 **Definition of Matter**. Solid, liquid and gas ; characteristics-shape, volume. change of state-melting (absorption of heat), freezing, evaporation (cooling by evaporation. condensation, sublimation.

1.2 **Nature of Matter** Elements, compounds and mixtures. Heterogenous and homogenous mixtures, colloids and suspension.

1.3 **Particle Nature and Their Basic Units**. Atoms and molecules, Law of constant proportions, atomic and molecular masses. Mole concept : Relationship of mole to mass of the particles and numbers.

1.4 **Structure of Atoms** Electrons, protons and neutrons, valency, chemical formula of common compounds. Isotopes and Isobars.

Unit 2 Chemical Reactions. Chemical equation, Balanced Chemical Equation, implications of a balanced chemical equation, types of Chemical reactions : composition, decomposition, displacement, double displacement, precipitation, neutralization, oxidation and reduction.

Unit 3. Acids, Bases and Salts. Their definitions in terms of furnishing of H+ and OH- ions, General properties, example and uses, concept of PH Scale (Definition relating to logarithm not required), Importance of PH in everyday life ; preparation and uses of Sodium Hydroxide, Bleaching powder, Baking Soda, Washing soda and plater of paris.

Unit 4. Metals and Non-Metals. Properties of metals and non metals; Reactivity series, formation and properties of ionic compounds; Basic metallurgical processes ; Corrosion and its prevention.

Unit 5. Carbon Compounds. Covalent bonding in carbon compounds. Versatile nature of carbon. Homologous series. Nomenclature of carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes, alkanes and alkynes), difference between saturated hydro carbons and unsaturated hydrocarbons. Chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction. Ethanol and Ethanoic acid (only properties and uses), soaps and detergents.

Unit 6. Periodic Classification of Elements. Need for classification, early attempts at classification of elements (Doberelner's Triads, Newland's law of Octaves, Mendeleev's Periodic Table, gradation in properties, valency, atomic number, metallic and non metallic properties.

Unit 7. Some Basic Concepts of Chemistry.

7.1 **General Introduction**. Importance and scope of Chemistry. Nature of Matter, laws of Chemical combination, Dalton's atomic theory, Concept of elements, atoms and molecules.

7.2 Atomic and Molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.

3.3 Numerical Problem based on properties of parallelogram, Condition for a quadrilateral to be a parallelogram and Numerical problems related to it.

UNIT-4

4.1 Trigonometry Trigonometrical ratio of acute angle in a right-angle triangle. Inverse relationship in trigonometrical ratio.

4.2 Trigonometrical ratio of angles 0°, 30°, 45°, 60°, 90°, 180°, 270° and 360°

4.3 Trigonometrical identities $\sin^2\Phi+\cos^2\Phi=1$, $\sec^2\Phi=1+\tan^2\Phi$, $\operatorname{cosec}^2\Phi=1+\cot^2\Phi$

4.4 Trigonometrical ratio of Sum and difference of two angles, Trigonometrical ratio of multiples of an angle. Sum of sines of two angles and difference of sines of two angles (i.e. SinC+SinD and SinC-SinD). Sum of cosines of two angles and difference of cosines of two angles (CosC+CosD, CosC-CosD). Simple problems based on the above.

4.5 Some Application of trigonometry

UNIT-5

5.1 Co-ordinate Geometry. Distance between two points, Co-ordinate of a point dividing a line segment in a given ratio, Area of a triangle.

5.2 Equation of straight line in different form (Gradient form, Intercept form, Perpendicular form). General equation of line.

5.3 Equation of a line parallel to a given line and perpendicular to a given line, Length of the perpendicular drawn from a point on a straight line.

5.4 Co-ordinate of a point of intersection of two lines, Angle between two straight lines.

5.5 In equality relation in triangle, similar triangle, cyclic quadrilateral – Problems based on these.

5.6 Problems related to the theorems on Circle and tangent to the circle.

UNIT-6

6.1 Statistics. Measure of central tendency- Arithmetic mean, Median, Mode of ungrouped and grouped data. Measure of dispersion; mean deviation, variance and standard deviation of ungrouped/ grouped data.

6.2 Probability. Random experiments outcomes, sample spaces (set representation). Events, occurrence of events, 'not' 'and' and 'or' events.

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(Presiding Officer)

Dr R Mohan, F Civ
(Member No-2)

PROPOSED SYLLABUS FOR ENTRANCE EXAM
AS PER REVISED EDUCATIONAL QP
MATHEMATICS

UNIT-1

1.1 Number System. Integers, Rational numbers, Properties of rational numbers (commutative law and Associative law for addition, additive identity, additive inverse, Commutative law and Associative law for multiplication, multiplicative identity, multiplicative inverse, distributive law), Decimal representation of rational number, Irrational numbers, decimal representation of irrational number.

1.2 Set theory. Representation of Set (Tabular or Listing form, Rule form), elements of Set, Types of Set (Finite and Infinite set, empty set, universal set, equal set, equivalent set, singleton set), subsets, union of sets, Intersection of sets, Set Difference, Complement of a set, Venn diagram and its application.

1.3 Logarithm. Meaning of logarithm, Common logarithm (logarithm of any number at base 10), characteristic and mantissa, Meaning of Anti-logarithm, Laws of logarithm.

UNIT-2

2.1 Factorisation of Algebraic Expression, factorisation of two-degree Polynomial, factorisation of two-degree trinomial by dividing middle term into two parts and by making perfect square.

2.2 Remainder theorem and factorisation theorem (Not Proof) and its use in factorisation of polynomial (Not greater than four degree).

2.3 Least Common Multiple (LCM) and Highest Common Factor (HCF) of Polynomials using factorisation.

2.4 Rational Expression. Meaning, Addition, Subtraction, Multiplication and division of Rational expression. Simplification of Expression, Additive Inverse and multiplicative Inverse of Rational expression.

2.5 Arithmetic Progression (A.P).

UNIT-3

3.1 Linear Equation in One Variable. Its application in Commercial mathematics and in mensuration.

3.2 Linear Equation in Two Variable. Solution of simultaneous linear equation in two variable, Consistent/ Inconsistent system of simultaneous linear equation, Problems based on system of linear equations.

3.3 Quadratic Equation. Solution of equation (using factorisation method and using formula), Discriminate of Quadratic equation, Nature of roots of the equation, forming a quadratic equation from given roots, Application of quadratic equation.

3.4 Mensuration. Curved surface area, Total surface area and volume of cube, cuboid, Right circular cylinder, cone and sphere.

5. Sound

(a) Characteristics of a Sound Wave: Longitudinal wave, concepts of Compression and Rarefaction, Frequency, Wavelength, Amplitude, Speed, Intensity, Pitch, Loudness.

(b) Numerical based on speed, wavelength and frequency of sound wave.

(c) Production and Propagation of Sound.

(d) Range of Hearing, Sonar and application of Ultrasound.

(e) Reflection of Sound, Echo.

(f) The Human Ear.

6. **Natural Phenomena**

(a) Reflection of light by curved surfaces, Images formed by spherical mirror, centre of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required), magnification, numerical.

(b) Refraction, Laws of refraction, refractive index, numerical.

(c) Refraction of light by spherical lens, Image formed by spherical lenses.

(d) Lens formula (Derivation not required), Magnification, Power of a lens, numerical.

(e) Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life.

(f) Human Eye, Defects of Vision and their corrections.

7. **Effects of Current**

(a) Electric current, potential difference, Ohm's law, Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, Parallel combination of resistors and its application in daily life. Electric power, Interrelation between P, V, I and R Numerical.

(b) Joule's law of heating effect of electric current and its applications.

8. **Magnetic Effects of Electric Current**

(a) Magnetic field, filed lines, magnetic field due to current carrying conductors.

(b) Alternating Current, its frequency.

(c) Advantages of AC over DC.

Unit 3. Structure of Atom. Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars, concept of shells and subshells, 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 completely filled orbitals.

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Sh SA Meshram, Assoc Prof
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APPX A

PROPOSED SYLLABUS FOR CIP ENTRANCE EXAM AS PER REVISED EDUCATIONAL QR

PHYSICS

1. Motion

(a) Distance, Displacement, Velocity, Speed and Acceleration, uniform and non uniform motion along straight line.

(b) Derivation of three Equations of Motion ($v = u+at$, $S= ut + \frac{1}{2} at^2$ and $v^2 = u^2+2aS$) with a Graphical Method.

(c) Numerical on Equations of motion.

(d) Concepts of uniform circular motion.

2. Force and Laws of Motion

(a) Force and motion.

(b) Balance and unbalanced force, Friction Force, Inertia.

(c) Newton's Laws of Motion.

(d) Momentum and Conservation of momentum.

(e) Action-Reaction forces.

(f) Numerical on Newton's laws of motion.

3. Gravitation

(a) Mass, Weight, Acceleration due to gravity (g), Universal Gravitation Constant (G), Relation between G and g. Values of g at poles, equator of the Earth, Numerical.

(b) Pressure and Thrust, Numerical.

(c) Buoyancy, Archimedes' Principle of floatation, Relative density, Numerical.

4. Work and Energy

(a) Concepts of Kinetic Energy and Potential Energy.

(b) Types of Energy, Law of Conservation of Energy.

(c) Work done, Power and Commercial unit of Energy, Numerical.