

APPENDIX – I

SYLLABI FOR DET- 2010 FOR ADMISSION INTO 1ST YEAR OF THE DIPLOMA COURSE

The syllabi given hereunder for DET-2010 are only illustrative and not exhaustive. The syllabi are in line with courses of studies in Mathematics & Science (Physics & Chemistry) for 10th Std. Examination, 2010 of Board of Secondary Education, Orissa.

MATHEMATICS (50 Nos.)

Ratio, Proportion & Variation: Definition, continued proportions, direct variation, inverse variation & joint variation.

Indices: Laws of indices, problems, solution of exponential equations.

Polynomials: Factorisation of polynomials, Remainder. Theorem, Factor Theorem, Synthetic division and their applications.

Equations: Different methods of solving simultaneous linear equations in two unknowns, problems, Quadratic equations, its solutions by completing the square, Discriminant, nature of roots, Relation between roots & coefficient, simple problems.

Logarithms: Definition, laws of logarithm, common logarithm, characteristics, Mantissa, Antilogarithm, Tables of logarithm and antilogarithm, applications.

Number System: Natural numbers, Integers, Rational numbers, Real numbers as union of rational and irrationals, Axioms on operations on real numbers.

Computers: Different parts of computer (Main parts only). Applications of computers, Binary number system, Conversion of binary to decimal and vice-versa.

Functions and Graphs: Domain and Range of Real valued function.

Mensuration: Circumference, Arc Length, Area of Sector of a circle, triangle, Rectangle, Square, Parallelogram, Trapezium, Rhombus. Surface area and volume of cylinder, Cone, Sphere.

Geometry: Straight lines and angle between two straight lines, Parallel lines, Theorems on congruency and similar triangles. Radius, Chord, Arc of a circle, cyclic quadrilaterals, Theorems and related problems.

Statistics: Data, Frequency distribution, Grouped frequency distribution, Graphical representation of data, Histograms, Pie diagrams & Frequency polygon, Measures of Central tendency (Mean, median & mode)

GENERAL SCIENCE (50 Nos.)

CHEMISTRY

Matter-

Nature & Behavior: Element, compound, Mixture, Type of mixture, Structure of matter, states of matter, atom, molecule, symbol & valency, Chemical formula, Chemical equation.

Atomic Structure: Electron, Proton, Neutron – their charge, mass & properties, atomic number, mass number, electronic configuration, mole concept.

Periodic classification: Periods & groups, periodic law properties of elements along a period and in groups.

Chemical Bond: Formation of ionic & covalent bonds, important properties of electrovalent and covalent compounds.

Physical and chemical changes: Difference between physical and chemical changes, combination reactions, displacement reactions, decomposition reaction, slow and fast reaction, catalyst, exothermic and endothermic reactions, Oxidation & reduction, Acids & Bases, PH Scale. Importance and general properties, preparation and uses of hydrogen.

Extraction of metal: Ore, mineral, general methods of extraction of metal, Ore dressing, Concentration, reduction, Purification, distillation, electrolytic refining.

Alloys: Definition, Ferrous and non-ferrous - Brass, Stainless Steel,

Sources of Energy: Types of fuel, Good fuel, Calorific value of fuel, Fossil fuels, Coal, Fractional distillation of petroleum products, Petroleum gas, petrochemicals, Natural Gas.

Water: Sources of water, soft and hard water, types of hardness, removal of hardness of water by cold and hot soda lime process.

Environmental Chemistry: Pollution of air and water (causes, health hazards & control)

PHYSICS

Motion: Uniform and non uniform motion, distance and displacement, velocity and acceleration, graphs for uniform and uniformly accelerated motion, Equation of motion.

Force: Force and motion, Newton's laws of motion, Momentum, Gravitational force, acceleration due to gravity mass and weight.

Thrust and pressure: Archimedes's Principle and its applications, relative density.

Work, Energy and Power: Work done by a force, relation between work and energy, Potential Energy, Kinetic energy, power, units of work, energy and power.

Heat: Heat and temperature, measurement of temperature, effects of heat, thermal expansion, change of State (Latent heat, cooling due to evaporation). Joule's law of mechanical equivalent of heat.

Electricity : conductors and resistors, measurement of current, potential difference and resistance, ammeter, voltmeter, Ohm's law, Combination of resistances in series and parallel connection, heating effect of electric current, Joule's law, electric appliances based on heating effect of current, measurement of electric energy units, power.

Magnetic effect of electric current : Magnetic field due to current carrying conductor, straight & circular wire, Fleming's Left Hand Rule, D.C. motor and its application, Generation of electricity, electromagnetic induction, Fleming's Right Hand Rule, Electric Generator, dynamo. Domestic electric circuits, elementary idea about wiring, fuse, possible hazards and safety measures

SYLLABUS FOR LATERAL ENTRY ENTRANCE EXAMINATION FOR ITI / +2 VOCATIONAL PASSED OUT HOLDERS:

The syllabi given hereunder for DET-2010 are only illustrative and not exhaustive. These Syllabi are in line with the courses of studies in Physics, Chemistry and Mathematics of First year Diploma course.

PHYSICS (30 Nos.)

1.0 UNITS, DIMENSIONS, SCALARS & VECTORS –

Dimension and dimensional formula of physical quantities, Vector addition & subtraction, Triangle law and parallelogram law of vector addition, Resolution of vector.

2.0 LINEAR & CURVILINEAR MOTION:

Equation of motion along a straight line, Projectile Motion, Kinetic Energy and Potential Energy, Uniform circular motion, angular displacement, angular velocity and Acceleration, Centripetal and centrifugal forces.

3.0 GRAVITATION AND S. H. M.

Newton's Law of Gravitation, Kepler's laws and its application, Variation of 'g' with altitude, depth & latitudes. (Simple numerical problem), Principle of launching of satellite, Escape velocity and orbital velocity of satellite. Amplitude, frequency and time period in S.H.M. Velocity and acceleration of a particle executing SHM.

4.0 SOUND & ACOUSTICS

Progressive wave and stationary wave. Longitudinal & Transverse Waves. Relation between different wave parameters, Newton's formula for velocity of sound and Laplace's correction, Effects of temperature, pressure and humidity on velocity of sound, Concept of Doppler's effect & its application, Acoustics of building., Echo

5.0 HEAT AND THERMODYNAMICS

Different units of heat, specific heat, thermal capacity, water equivalent and latent heat. Principle of calorimetry (Numerical problems), Relationship between Coefficient of Linear, Superficial and Cubical expansion of Solids, Relationship between Coefficient of real and apparent expansion of liquids, 1st law of thermodynamics, Relationship between C_p and C_v , thermal conductivity and its unit, mechanical equivalent of heat.

6.0 OPTICS

Reflection, Refraction, Laws of Reflection and Refraction, Critical Angle, Total Internal Reflection, Simple Numerical problem on mirror and lens formula. Power of Lens.

7.0 ELECTROSTATICS & MAGNETISM

Coulomb's law in Electrostatics, Unit charge, Electric field intensity and Electric Potential, Capacity of a parallel plate capacitor and the effect of dielectric on the capacitance of the capacitor, Grouping of capacitors in series and parallel (Simple Numerical problems), Coulomb's laws in Magnetism, Unit Pole, Magnetic field Intensity, Magnetic line of force, Magnetic flux, Flux density, Magnetic moment of a Bar magnet.

8.0 CURRENT ELECTRICITY

Ohm's law, laws of resistance, specific resistance, Effect of temperature on resistance, Grouping of resistors in series and parallel. Kirchoff's laws and its application to Wheatstone Bridge. Electrical Energy and electric Power. Joule's laws of heating effect of electric current (Simple numerical problems).

9.0 MAGNETIC EFFECT OF CURRENT

Biot-Savarts law, formula for Magnetic field Induction due to current through a straight wire and at the centre of a circular coil, simple numerical problems, Force experienced by a current carrying conductor placed in a magnetic field. Fleming's left hand Rule.

10.0 ELECTROMAGNETIC INDUCTION

Faraday's laws of Electromagnetic Induction, Lenz's law, Fleming's Right Hand Rule,

11.0 NUCLEAR AND MODERN PHYSICS

Atomic Number, Mass Number, Mass Defect and Binding Energy, Nuclear fission and Nuclear fusion, Application of nuclear fission & nuclear fusion, Properties & uses of Alpha, Beta and Gamma rays. Concept of X Rays, Application of X-Rays, Concept of super conductivity.

CHEMISTRY (30 Nos.)

Chapter-1 (Physical Chemistry)

- 1.1 Chemical formula, Chemical Equation, Balancing of Chemical equation by hit & trial method & Partial equation Method.
- 1.2 Bohr's atomic model, Bohr Bury Scheme, electronic configuration, Aufbau's Principle, Hund's Rule, Pauli's exclusion Principle.
- 1.3 Definition of Chemical Bond, Types of Chemical Bond :- Electrovalent, Covalent and Co-ordinate bond with example
- 1.4 Arrhenius theory, Lowry Bronsted theory and Lewis theory of Acid and Base. Determination of equivalent mass of Acid and Base. PH of a solution, its application, Buffer solution and its application.
- 1.5 Definition of Electrolyte, electrolytic cell, faraday's 1st law and 2nd law of electrolysis Application of electrolysis : Electroplating and Electrorefining.

Chapter-2 Inorganic Chemistry:-

- 2.1 Define Mineral, ore, flux, slag with examples : General method of extraction of metal :- Dressing, Concentration, Calcination, Roasting, Reduction.
- 2.2 Composition and uses of Brass, Bronze, Bell metal.

Chapter-3 Organic Chemistry

- 3.1 Difference between saturated hydro-carbon and unsaturated hydrocarbon.
- 3.2 IUPAC system of nomenclature of alkane, alkene, alkyne, alkylhalide

Chapter-4 Industrial Chemistry

- 4.1 Types and causes of hardness of water removal of hardness by lime soda and ion exchange method.
- 4.2 Types of lubricant and their uses.
- 4.3 Definition and classification of fuel calorific value of fuel.
- 4.4 Definition of Monomer, Polymer, Homopolymer, Copolymer, Composition and uses of Polythene, Polyvinyl chloride.

Chapter-5 Environmental Chemistry

- 5.1 Definition with example – Pollutant, contaminant, receptor, pathway of pollutant.
- 5.2 Water Pollution – its sources and effect on human health.
- 5.3 Air Pollution – its sources and effect on human health, green house effect, Acid rain.

MATHEMATICS (40 Nos.)

1. ALGEBRA

1. Complex Numbers
2. Binomial Theorem
3. Determinant
4. Matrices
5. Partial Fraction

1. TRIGONOMETRY

Trigonometric ratios, Trigonometric equation, properties of triangle and Inverse circular function.

2. Geometry (2D & 3D)

Two dimensional and three dimensional co-ordinates (in Cartesian form only), distance between two points, equation of straight line, circle, sphere and Plane.

4. Calculus

Variables, Limits and continuity, differentiation of simple functions.

Successive differentiation upto second order, Maxima & Minima, partial differentiation, Euler's Theorem on Homogeneous function upto 2nd order only.

5. Integral Calculus

Integration of algebraic and Trigonometric function, Determination of area bounded by, $y = f(x)$ when $x = a$ and $x = b$ & $x - axis$ & $x = f(y)$ when $y = a$ and $y = b$ and $y - axis$. Simple differential equations (first order and first degree), vector additions and multiplication and their applications. .

SYLLABI FOR DET- 2010 FOR ADMISSION INTO NON-ENGINEERING DIPLOMA COURSE

The syllabi given hereunder for DET-2010 are only illustrative and not exhaustive. The syllabi are in line with courses of studies in English, Current Affairs/ General Knowledge, General Science/Everyday Science/Basic Mathematics of 10th Std. Examination.

ENGLISH: 40 Nos.

1. Grammar-Students should be able to answer grammatical questions like fill in the blanks, correcting the errors and finding out the correct answer in relation to following areas of grammar.

1.1. Determiners, 1.2. Verbs, 1.3. Tense, 1.4. Prepositions, 1.5. Synonyms, 1.6. Antonyms, 1.7. Model verbs, 1.8. Subject-Verb Agreement,

2. Reading comprehension:

A passage of 100 to 150 words would be given. Multiple choice questions would be set on the passage.

CURRENT AFFAIRS GENERAL KNOWLEDGE : 20 nos.

1. National & International affairs, 2. Sports, 3. Invention and Discoveries, 4. Art & Culture.

GENERAL SCIENCE / EVERYDAY SCIENCE: 20 nos.

A. PHYSICS:

1. **Motion:** Uniform and non uniform motion, distance and displacement, velocity and acceleration
2. **Force:** Force and motion, Newton's laws of motion, Gravitational force, acceleration due to gravity mass and weight.
3. **Heat:** Heat and temperature, measurement of temperature, thermal expansion, change of State.
4. **Light:** Reflection, laws of reflection, types of mirror, reflection from plain mirror, refraction, laws of refraction, power of lens.
5. **Electricity:** conductors and resistors, measurement of current, potential difference and resistance, ammeter, voltmeter, Ohm's law
6. **Sound: Production and propagation of sound and its velocity in medium.**

B. CHEMISTRY:

1. **Matter-** Element, compound, Mixture, Type of mixture, , states of matter, atom, molecule, symbol & valency, Chemical formula, Chemical equation.
2. **Atomic Structure:** Electron, Proton, Neutron & their charge, mass, atomic number, mass number, electronic configuration.
3. **Bonding:** Formation of ionic & covalent bond, important properties of electrovalent and covalent bond.

2. For electroplating metal M on metal N, we have to take
- (A) 'M' as anode, 'N' as cathode and the solution of salt of 'N' as electrolyte.
 - (B) 'N' as anode, 'M' as cathode and the solution of salt of 'M' as electrolyte.
 - (C) 'M' as anode, 'N' as cathode and the solution of salt of 'M' as electrolyte.
 - (D) 'N' as anode, 'M' as cathode and solution of 'N' as electrolyte.

MODEL QUESTION FOR LATERAL ENTRY ENTRANCE EXAMINATION FOR ITI / +2 VOCATIONAL PASSED OUT HOLDERS

MATHEMATICS

1) Solution of the differential equation

$$\frac{dy}{dx} = x \sin x \text{ is}$$

- (A) $y = x \cos x - \sin x + c$
- (B) $y = x \sin x + \cos x + c$
- (C) $y = x \cos x - x \sin x + c$
- (D) $y = -x \cos x + \sin x + c$

PHYSICS

1) N-type Semiconductor is obtained by doping intrinsic Germanium with

- (A) Phosphorous
- (B) Aluminium
- (C) Boron
- (D) Gold

CHEMISTRY

1) % of nitrogen in the atmosphere is :

- (A) 50%
- (B) 78%
- (C) 87%
- (D) 65%

MODEL QUESTIONS FOR DET – 2010 FOR ADMISSION INTO NON-ENGINEERING DIPLOMA COURSE

ENGLISH

A) Fill in the blanks with appropriate choice from the list given below:-

1. He _____ play chess while he in school.
a) Might, b) would, c) could, d) should, e) none.
2. By the time we reach the stadium, the match_____.
a) had started, b) will have started, c) would start, d) started, e) none.

B) Doing house work, taking care of children and carrying out assorted jobs for husbands are work just as much as is performing paid employment in an office or factory. To ignore this is to do a disservice to women in the labour force. The reality of house work is that women's work in the home averages 56 hours per week for the fulltime home maker and 26 hours per week for the employed wife/mother. Husbands and children barely increase their contribution to house work and childcare when the wife/mother is in the labour force. As a result, the employed woman with family responsibility gives up most of her leisure to carry out the responsibilities of family life.

Answer the following.

1. Is the house work taken by a house wife as much as the paid employment in an office or factory?
a) No, b) Almost as much as, c) Yes, d) None.
2. A house wife works for _____ hours per week.
a) 46, b) 56, c) 76, d) 26, e) none.

3. An employed woman gives up most of her leisure for the sake of _____
a) Family responsibilities, b) family entertainment, c) her own entertainment outside, d) none.
- C) Correct the error if any about the underlined portion.
1. The boy is learning against the wall.
a) on, b) at, c) in, d) none.
2. It is 7 O'clock in my watch
a) at, b) by, c) with, d) none.
3. Neither the cock nor the hens is in the yard.
a) has, b) were, c) was, d) had, e) none.
4. Time and tide wait for none.
a) had waited, b) waits, c) waited, d) had waited, e) none.

MATHEMATICS

1. If the roots of equation $4x^2 + (1+m)x + 1 = 0$ are equal, the values of m are
(A) (-5, -3), (B) (-5, 3), (C) (5, -3), (D) (5, 3)
2. Valency of aluminium is
(A) +1, (B) -1, (C) -3, (D) +3
3. Unit of resistance is
(A) Volt, (B) Ampere (C) Ohm (D) Ohm-meter
4. Power House of the Cell is
(A) Lysosome, (B) Nucleus, (C) Mitochondria, (D) Ribosome.

