GROUP-01

Common Higher Secondary Level (Level of Exam-10+2 in any discipline)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc. - **(Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**.** - **(Weightage 10%)**

3) Subject related syllabus- **(Weightage 70%)**

A. General Awareness

Questions from the General Awareness section are designed to test the candidate's general knowledge of the environment around him and its applications to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining to History, Culture, Geography, Economic Scene, General policy, Static Awareness, and scientific research.

Introduction to Indian Constitution: Preamble, Fundamental duties and fundamentals rights only, Traffic Rules, Traffic signs, Penalties for violating traffic rules, first aid, safety precautions and occupational health, Welfare Schemes run by Government of Haryana and provisions.

FUNDAMENTALS OF INSURANCE: Introduction to insurance, Contract of life insurance, Fire insurance, Marine insurance, Accident and motor insurance, Farm Crop Insurance, Insurance intermediaries – role of agents and procedure for becoming an agent; cancellation of license; revocation/suspension/termination of agent appointment; code of conduct; unfair practices.

B. General Intelligence

This section includes questions of both verbal and non-verbal reasoning. The questions will be asked from:

Semantic Analogy, Symbolic operations, Symbolic/ Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Symbolic/ Number Classification, Drawing inferences, Figural Classification, Punched hole/ pattern folding & unfolding, Semantic Series, Figural Pattern-folding and completion, Emotional Intelligence, Word Building, Social Intelligence, Coding and de-coding, Other sub-topics if any Numerical operations,

C. English Language

The English Language questions will be asked from the following topics:

Spot the Error, fill in the Blanks, Synonyms/ Homonyms, Antonyms, Spellings/ Detecting misspelt words, Idioms & Phrases, One-word substitution, Improvement of Sentences, Active/ Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage, English/Hindi words & terminology used in offices and their inter-translation.

D. Quantitative Aptitude

Number Systems: Computation of Whole Number, Decimal and Fractions, Relationship between numbers.

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like $\sin^2\theta + \cos^2\theta = 1$ etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar-diagram, Pie-chart.

E. HINDI

Hindi Language:

शब्द, अलंकार, विकारीशब्द, वाक्य, अविकारीशब्द, पद, पदबंध, मुहावरें, लोकोक्तियां, संधि, उपसर्ग, प्रत्यय, समास, पर्यायवाची, विलोम व अनेकार्थीशब्द, अयोगवाह, वाक्य शोधन, निपात(अवधारक), विरामचिन्ह, संबंधबोधक, अनेकशब्दों के लिए एक षब्द, एकार्थकशब्द, युग्मशब्द, वर्तनी(शब्द एंव वाक्य शुद्धिकरण), वर्ण, स्वर, व्यंजन, विदेशी ध्वनियाँ, संज्ञा, सर्वनाम, विशेषण, क्रिया, क्रिया विशेषण, समुच्चय बोधक, विस्मय बोधक, वचन, लिंग, कारक, काल, तदभव–तत्समशब्द

F. Haryana economy:

nature, characteristics and problems; concept of economic development; State of the Haryana economy since its inception: Income; Population, Health & Nutrition and declining sex ratio, Haryana agriculture: nature, cropping pattern, role of agriculture in Haryana economy, Measures for development in agriculture, crop insurance, Agriculture credit: agriculture finance, types of agriculture finance; credit needs of farmers; sources of credit: institutional and non-institutional sources; NABARD; rural indebtedness: causes, consequences and debt relief measures, Micro, small & medium enterprises (MSME) in Haryana: meaning, role, performance and challenges; SEZ, Growth of MNCs in Haryana, Role of HSIIDC, HFC, HAFED, HKVIB, Haryana budget: objectives and policies, sources of revenues and its utilization.

G. Rural Marketing:

Meaning, nature, characteristics; opportunities and challenges to rural markets in Haryana; Socio-cultural, economic, demographic, technological and other environmental factor affecting rural marketing; rural consumer behaviour; segmentation of rural market; strategies for rural marketing; rural marketing mix; difference in rural and urban market; problems in rural marketing; Strategies for rural marketing, Product planning, pricing, promotion and management of distribution channels for marketing of durables and non-durables in rural areas; Planning and organizing personnel selling in rural markets; Innovation in rural market; E-commerce in rural markets, e-chaupal & other similar initiatives in rural markets.

H. Environmental Studies and Disaster Management

Multidisciplinary nature of environmental studies, Natural Resources, Forest resources, Water resources, Mineral resources, Food resources, Energy resources, Land resources, Ecosystems, Energy flow in the ecosystem, Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Biodiversity and its conservation, Value of biodiversity, Hot-sports of biodiversity, Threats to biodiversity, Endangered and endemic species of India. Conservation of biodiversity, Environmental Pollution, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. nuclear hazards. Solid Waste Management, Social Issues and the Environment, Environmental ethics, Wasteland reclamation, Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Human Population and the Environment, Environment and human health, Role of Information Technology in Environment and human health.

DISASTER MANAGEMENT: Natural Disasters, Climatic change, Man Made Disasters, Disaster Management, International strategy for disaster reduction, national disaster management framework; financial arrangements; role of NGOs, community –based organizations and media. Central, state, district and local administration; Armed forces in disaster response; Disaster response; Police and other organizations.

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.

GROUP-02

Draughtsman Civil Jobs (Level- Matric+ Diploma in Draughtsman civil)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc.- **(Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**. -**
(Weightage 10%)

3) Subject related syllabus- **(Weightage 70%)**

Importance of safety and general precautions observed in the in the industry/shop floor, working of Industrial Training Institute system including stores procedures. Soft Skills: its importance andJob area after completion of training, Introduction of First aid, Introduction of PPEs, Introduction to 5S concept& its application, Response to emergencies e.g.;power failure, fire alarm, etc.

Familiarisation& informationabout rules and regulations of the Institute and Trade, List of the Instruments, equipment's and materials to be used during training.

Importance of B.I.S. Introduction of Code for practice of Architectural and Building Drawings (IS: 962-1989, SP-46:2003), Layout of drawing. Lines, Lettering, Dimensioning, Knowledge of different typesof scale. Principle of R.F.

Materials:

Stones: –characteristics, types & uses, Bricks –. Manufacturing, characteristics of good bricks, types,uses and hollow bricks, Lime– characteristics, types, manufacturing &its uses, Pozzolanic: - characteristics, types & uses, Cement: – Manufacturing, characteristics, types, uses and test of good cement, Different types of projection views: Orthographic, Isometric, Oblique and Perspective.

Building materials: -

Sand: -characteristics,types&uses, Clay Products: – types,earthenware, stoneware, porcelain, terracotta, glazing, Mortar& Concrete: –Types,uses, preparation, proportion, admixtures and applications, Timber: - Types, Structure, disease & defects, characteristic, seasoning, preservation and utility, Alternative material to Timber, Plywood, Block board, Particle board, Fireproof reinforced plastic (FRP), Medium density fireboard (MDF) etc. Tar, bitumen, asphalt: -Properties, application and Uses, Protective materials: -Paints: - characteristic, types, uses,Varnishes: – characteristics and uses, Metal: – characteristic, types, uses, Plastics: – characteristic, types, uses.

Building Construction: -

Sequence of construction of a building, Name of different parts of building, Stone masonry:Terms, use and classification, Principle of construction, composite masonry, Strength of walls, Strength of masonry, Brick masonry – principles of construction of bonds, Toolsand equipment's used.

Foundation: - Purpose of foundation, Causes of failure of foundation, Bearing capacity of soils, Dead and live loads, Examination of ground, Types of foundation, drawing of footing, foundation setting out of building on ground excavation, Simple machine foundation

Types of shoring and scaffolding in details, Types of Underpinning and Timbering in detailTreatments of building

structures: - DPC Sources and effects of dampness, Method of prevention of dampness in building

Damp proofing materials –properties, function and types.

Anti-termite treatment –objectives, uses and applications.
Arches: - Technical terms-types,centring

Lintel: -types, wooden, brick, stone, steel & RCC.

Chajjahs – characteristics, Centring & Shuttering

Carpentry joints: - terms,classification of joints,Uses, types of fixtures, fastenings.

Doors –Parts, Location, standard sizes, types.

Windows-types, Ventilators-purpose-types.

Electrical Wiring: -Safety precaution and elementary first aid, Artificial respiration and treatment of electrical shock, Elementary electricity, General ideas of supply system, Wireman's tools kit, Wiringmaterials, Electrical fittings, System of wirings. Wiring, installation for domestic lightings.

Floors – Ground floor & upper floor-Types, flooring- materials used Types

Stairs: - Terms, Requirements,Planning and designing of stair and details, of construction.

Basic concept of lift andEscalator

Roofs & Roof coverings: –purposes, Elements, Types, Fla, pitched, Truss-king post, queen post, mansard, bel-fast, steel, composite.

Roof & coverings –objectives, types & uses.

Surveying:-Introduction, History and principles of chain survey, Instrument employed, Use, care, maintenance andcommon terms, Classification, accuracy, types, Main divisions (plane & geodetic), Chaining, Speed in field and office work, Knowledge of Mouza Map,

Compass survey: - Instrument and it's setting up, Bearing and each included angle of close traverse, Local attraction, Magnetic declination and itstrue bearing, Precaution in using prismatic compass.

Plane table survey: - Instrument used in plane table survey, Care and maintenance of plane table

Levelling: - Auto level, dumpy Level,Tilting Level - introduction, definition, Principle of levelling, Levelling staffs, itsgraduation & types, Minimum equipment required, Types,component / part and function, Temporary and permanent, adjustment, procedure in setting up, Level& horizontal surface, Datum Benchmark,Focussing& parallax, Deduction of levels / Reduced Level, Types of levelling, Application to chain and Levelling Instrument to Building construction.

Contouring; -Definition, Characteristics, Methods, Direct and Indirect methods, Interpolation of Contour, Contour gradient, Uses of Contour plan and Map, Knowledge on road project,

Theodolite survey: - Introduction, Types of theodolites, Uses, Methods of Plotting, Transit vernier theodolite, Terms of transit theodolite, Fundamental line oftheodolite, Adjustment of theodolite, Checks, Adjustment of errors, Open and closed traverse and their application toEngineering Problems, Vernier scale- types, Measurement of horizontal angle, Measurement of vertical angle, Adjustment of a close, traverse, Problems in transit, theodolite-departure, latitude, northing andeasting.

WORKSHOP CALCULATION & SCIENCE:

Unit, Fractions, Classification of unit system, Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units, Measurement units and conversion, Factors, HCF, LCM and problemsFractions - Addition, subtraction, multiplication & division, Decimal fractions - Addition, subtraction, multiplication& division, solving problems, square root, Ratio and Proportions, Percentage, Square and square root, Simple problems using calculator, Applications of Pythagoras theorem and related problems, Ratio and proportion, Ratio and proportion - Direct and indirect proportions, Percentage, Percentage - Changing percentage to decimal and fraction, Centre of gravity - Centre of gravity and its practical application, Area of cut out regular surfaces and area of irregular surfaces, Area of cut out regular surfaces - circle, segment and sector of circle, Related problems of area of cut out regular surfaces - circle, segment and sector of circle Area of irregular surfaces and application related to shop problems, Algebra - Addition , subtraction, multiplication & division, Theory of indices, algebraic formula, related problems, Elasticity - Elastic, plastic materials, stress, strain and their unitsand young's modulusElasticity - Ultimate stress and working stress, Profit and loss - Simple problems on profit & loss, Simple and compound interest, Estimation and costing - Simple estimation of the requirement of material etc., as applicable to the trade, Estimation and costing - Problems on estimation and costing

Material Science

Types metals, types of ferrous and nonferrous metals, Physical and mechanical properties of metals, Introduction of iron and cast iron, Difference between iron & steel, alloy steel and carbon steel, Properties of timber, Mass, Weight, Volume and Density, Mass, volume, density, weight and specific gravity, Heat & Temperature and Pressure, Concept of heat and temperature, effects of heat, difference,

between heat and temperature, boiling point & melting point of different metals and non-metalsScales of temperature, Celsius, Fahrenheit, kelvin and conversion, between scales of temperature, Heat &Temperature - Temperature measuring instruments, types of thermometer, pyrometer and transmission of heat - Conduction, convection and radiationCo-efficient of linear expansion and related problems.

Mensuration

Area and perimeter of square, rectangle and parallelogram, Area and perimeter of Triangles, Area and perimeter of circle, semi-circle, circular ring, sector ofcircle, hexagon and ellipse, Surface area and volume of solids - cube, cuboid, cylinder, sphere, and hollow cylinder, Finding the lateral surface area, total surface area and capacity in litres of hexagonal, conical and cylindrical shaped vessels

Trigonometry

Measurement of angles, Trigonometrical ratios, Trigonometrical tables, Application in calculating height and distance (Simple applications)

Building: -

Principle of planning, Objectives & importance, Function& responsibility, Orientation, Local building Bye-Laws asper ISI code, Lay out plan & key plan, Submitted in compositionof drawing, Provisions for safety, Requirement of green belt and land, Computer aided drafting: -Operating system,Hardware& software, Introduction of CAD, Its Graphical User Interface, Method of Installation, Basic commands of CAD, Knowledge of Tool icons and set of Toolbars, Knowledge of shortcut keyboard commands, Building Planning:-Economy & orientation, Provision for lighting andventilation, Provision for drainage and sanitation, Types of building, Planning & designing of residential , public and commercial building, Prefabricated Structure:-Preparation, Method of construction, assembling, Advantages & disadvantages, 3D modelling concept in CAD, 3D coordinate systems to aid in the construction of 3D objects, Knowledge of shortcut keyboard commands, Parks &play ground-Typesof recreation, landscaping, etc. Concepts of design ofearthquake resisting buildings- requirements resistance, safety, flexible building elements, special requirements, base, isolation techniques, Reinforced cement concrete

structure: -

Introduction to RCC uses, Materials – proportions, Form work, Bar bending details as per IS Code, Reinforced brick work, Materials used for RCC:-Construction, Selection of materials –coarse aggregate, fine aggregate, cement water and reinforcement, Characteristics, Method of mixing concrete – machine mixing and hand mixing, Slump test, Structure – columns,beams, slabs - one-way slab & two-way slab, Innovative construction, Safety against earthquake, Grade of cement, steel, behaviour and test, Bar-bending schedule, Retaining wall, R.C.C. Framed structure.

Steel structures: -

Conmen forms of steelsections, Structural fasteners, Joints, Tension & compression member, Classification, fabrication, Construction details, House drainage of building: -Introduction, Terms used in PHE, Systems of sanitation, System of house drainage, plumbing, sanitary fittings, etc.

Types of sewers

Appurtenance, Systems of plumbing, Manholes & Septic tank, Water treatment plant, Sewerage treatment plant

Roads: -

Introduction, History of highway development, General principles of alignment, Classification and construction of different types of roads,Component parts, Road curves, gradient, Curves-types, designation of curves, Setting out simple curve by successive bisection from long chords, simple curve by offsets from long chords, Road drainage system.

Bridges & Culvert: -

Introduction to bridges, Component parts of bridge, Classification of culverts, IRC loading, Selection of type and location, Factors governing theideal site, Alignment of bridge, Foundation – selection, caisson, Coffer dam- types, Types of super structure, Substructure-piers,abutments, wing walls, Classification of bridge.

Tunnels- rules used for the sizes of different members.

Irrigation Engineering: -

Terms used in irrigation, Hydrology like duty, delta, base period, intensity of irrigation, Hydrograph, peak flow, run off, catchment area, CCA, corps like, rabi, kharifetc. Storage, diversion headwork - characteristics and types, Reservoir –types of reservoirs, i.e., single purpose and multipurpose, area, capacity, and curves of reservoir, Dams, weir & barragestypes purposes, Hydroelectric project like, Forebay, Penstock, Turbines, Power house, etc.Canals- classification and distribution system, canal structures, Types of cross drainage, works like Aqua duct, Super passage, Syphon, Level crossing, inlet and outlet, etc.

Estimating and Costing: -

Introduction, Purpose and commontechniques, drawing of construction, Measurement techniques, Estimate-necessity, importance, types, approximate and detailed estimate-main and sub estimates, revised, supplementary, maintenance / repairestimate-taking off quantities- method, Rate analysis of typical items and their specifications, Labour and materials, Govt. Schedule of rate, Estimating of irregular, boundaries by trapezoidaland Simpsons formula,

Total Station: -

Introduction, Components parts, accessories used, characteristics, features, advantages and disadvantages, principle of EMD, Working and need, Setting and measurement, Electronic, display & Data reading, Rectangular and polar coordinate system, Terminology of open andclosed traverse

GPS (Global PositioningSystem): -

Introduction of GPS system, Co- ordinate and timesystem, Satellite and conversional geodetic system, GPS. Signal, code, and biases, Role of TRANSIT in GPS Development, GPS segment organisation, GPS survey methods. Basic geodetic co-ordinate, Ground supportequipment, signals, Tracking devises& system, Time measurement and GPS timing.

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.

GROUP-03

Network Assistant/JTA/Store man (Level of Exam- Diploma in ECE)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc. - (**Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**. -**

(Weightage 10%)

3) Job Oriented syllabus- **(Weightage 70%)**

Fundamentals of Communication

Concept and Process of Communication, Types of Communication (Verbal Communication), Barriers to Communication, Speaking Skill: Significance and essentials of Spoken Communication, Listening Skill: Significance and essentials of Listening.

Trigonometry

Concept of angle, measurement of angle in degrees, grades, radians and their conversions, T-Ratios of Allied angles (without proof), Sum, Difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa, Applications of Trigonometric terms in engineering problems such as to find an angle of elevation, height, distance etc.

Co-ordinate Geometry

Cartesian and Polar co-ordinates (two dimensional), Distance between two points, mid-point, centroid of vertices of a triangle, Slope of a line, equation of straight line in various standards forms (without proof); (slope intercept form, intercept form, one-point form, two-point form, symmetric form, normal form, general form), intersection of two straight lines, concurrency of lines, angle between straight lines, parallel and perpendicular lines, perpendicular distance formula, conversion of general form of equation to the various forms.

Geometry of Circle and Software

General equation of a circle and its characteristics. To find the equation of a circle, given: I. Centre and radius II. Three points lying on it. III. Coordinates of end points of a diameter.

MATLAB Or SciLab software – Theoretical Introduction, MATLAB or SciLab as Simple Calculator (Addition and subtraction of values –Trigonometric and Inverse Trigonometric functions) – General Practice.

Properties of Matter

Elasticity and plasticity- definition, deforming force, restoring force, example of elastic and plastic body, Definition of stress and strain, Hooke's law, modulus of elasticity, Pressure- definition, atmospheric pressure, gauge pressure, absolute pressure, Pascal's law, Surface tension- definition, SI unit, applications of surface tension, effect of temperature on surface tension, Viscosity: definition, unit, examples, effect of temperature on viscosity.

Heat and Temperature

Definition of heat and temperature (on the basis of kinetic theory), Difference between heat and temperature, Principle and working of mercury thermometer, Modes of transfer of heat- conduction, convection and radiation with examples, Properties of heat radiation, Different scales of temperature and their relationship.

Wave Motion and its Applications:

Waves: definition, types (mechanical and electromagnetic wave), Wave motion- transverse and longitudinal with examples, terms used in wave motion like displacement, amplitude, time period, frequency, wavelength, wave velocity; relationship among wave velocity, frequency and wave length, Simple harmonic motion (SHM): definition, examples, Cantilever: definition, formula of time period

(without derivation), Free, forced and resonant vibrations with examples, Sound waves: types (infrasonic, audible, ultrasonic) on the basis of frequency, noise, coefficient of absorption of sound, echo.

Optics

Reflection and refraction of light with laws, refractive index, Lens: introduction, lens formulae (no derivation), power of lens and simple numerical problems, Total internal reflection and its applications, critical angle and conditions for total internal reflection, Superposition of waves (concept only), definition of Interference, Diffraction and Polarization of waves, Introduction to Microscope, Telescope and their applications.

Electrostatics and Electricity: Electric charge, unit of charge, conservation of charge, Coulomb's law of electrostatics, Electric field, electric lines of force (definition and properties), electric field intensity due to a point charge, Definition of electric flux, Gauss law (statement and formula), Capacitor and capacitance (with formula and unit), Electric current and its SI Unit, direct and alternating current, Resistance, conductance (definition and unit), Series and parallel combination of resistances, Ohm's law (statement and formula).

FUNDAMENTALS OF IT

Basics of Computer: Brief history of development of computers, Definition of Computer, Block diagram of a Computer, Hardware, Software, Booting: Cold and Hot Booting, Interaction between the CPU and Memory with Input/Output devices, Function of CPU and major functional parts of CPU. Memory, Bit, Nibble, Byte, KB, MB, GB, TB, PB, Functions of memory, Use of storage devices in a Computer, List types of memory used in a Computer, Importance of cache memory, CPU speed and CPU word length.

Basic Internet Skills: Understanding browser, Introduction to WWW, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals. Advantages of Email, Various email service providers, Creation of email id, sending and receiving emails, attaching documents with email and drive. Effective use of Gmail, G-Drive, Google Calendar, Google Sites, Google Sheets, Online mode of communication using Google Meet & WebEx.

Basic Logic building: Introduction to Programming, Steps involved in problem solving, Definition of Algorithm, Definition of Flowchart, Steps involved in algorithm development, differentiate algorithm and flowchart, symbols used in flowcharts, algorithms for simple problems, flowcharts for simple problems, Practice logic building using flowchart/algorithms.

Office Tools: Office Tools like LibreOffice/OpenOffice/MSOffice. OpenOffice Writer – Typesetting Text and Basic Formatting, Inserting Images, Hyperlinks, Bookmarks, Tables and Table Properties in Writer Introducing LibreOffice/OpenOffice Calc, Working with Cells, Sheets, data, tables, using formulae and functions, using charts and graphics. OpenOffice Impress – Creating and Viewing Presentations, Inserting Pictures and Tables, Slide Master and Slide Design, Custom Animation.

Use of social media: Introduction to Digital Marketing – Why Digital Marketing, Characteristics of Digital Marketing, Tools for Digital Marketing, Effective use of social media like LinkedIn, Google+, Facebook, Twitter, etc.: Features of social media, Advantages and Disadvantages of social media.

FUNDAMENTAL OF ELECTRICAL ENGINEERING

Electrical Fundamentals: Nature of Electricity, Charge, free electrons, Electric current, Electric potential and potential difference, Electric current, Electrical Energy, Electrical power and their unit, Resistance: Definition, Unit, Laws of resistance, conductivity and resistivity, Effect of temperature on resistance, Temperature coefficient of resistance, Types of resistance & their applications, Colour coding of resistance, Inductors and capacitors with their wattage consideration, Factors affecting capacitance of a capacitor. Capacitors in series and parallel.

DC Circuits & Theorems: Ohm's law and its verification, Kirchhoff's current law and Kirchhoff's voltage law, Star – Delta connections, Voltage and current source, symbol and graphical representation, characteristics of ideal and practical sources, Mesh and Loop analysis, Thevenin's theorem, Norton's theorem, Superposition Theorem, Maximum Power Transfer Theorem.

AC Circuits: AC Fundamentals: Cycle, frequency, time period, amplitude, difference between AC and DC, instantaneous value, average value, r.m.s. value, maximum value, form factor and peak factor, Concept of conductance, susceptance, admittance, impedance and concept of inductive and capacitive reactance,

RL-RC Circuits, Introduction to series and parallel resonance and its conditions, Power in pure resistance, inductance and capacitance, power in combined RLC circuits, Power factor, active and reactive power: Definition and their significance.

Electro Magnetic Circuit: Concept of electro-magnetic field produced by flow of electric current, magnetic circuit, concept of magneto-motive force (MMF), flux, reluctance, permeability, analogy between electric and magnetic circuit, Faraday's laws of electro-magnetic induction, principles of self and mutual induction, self and mutually induced emf, Energy stored in an inductor, series and parallel combination of inductors.

Batteries: Basic idea of primary and secondary cells, Construction, working principle and applications of Lead-Acid, Nickel-Cadmium, Li-Ion batteries, Series and parallel connections of batteries, Introduction to maintenance of free batteries, Disposal of batteries, General idea of solar cells, solar panels and their applications.

ELECTRONIC DEVICES AND CIRCUITS

Semiconductor Physics: Review of basic atomic structure and energy levels, concept of insulators, conductors and semiconductors, atomic structure of Germanium (Ge) and Silicon (Si), covalent bonds, Concept of intrinsic and extrinsic semiconductor, process of doping, Energy level diagram of conductors, insulators and semiconductors; minority and majority charge carriers, P and N type semiconductors and their conductivity, effect of temperature on conductivity of intrinsic semiconductors.

Semiconductor Diode: PN junction diode, mechanism of current flow in PN junction, forward and reverse biased PN junction, potential barrier, drift and diffusion currents, depletion layer, concept of junction capacitance in forward and reverse biased condition, V-I characteristics, static and dynamic resistance and their value calculation from the characteristics, Application of diode as half-wave, full wave and bridge rectifiers. Peak Inverse Voltage, rectification efficiencies and ripple factor calculations, shunt capacitor filter, series inductor filter, LC and π filters, Types of diodes, characteristics and applications of Zener diodes. Zener and avalanche breakdown, Introduction to Clipping and Clamping Circuits.

Introduction to Bipolar-Transistors: Concept of a bipolar transistor, its structure, PNP and NPN transistors, their symbols and mechanism of current flow; Current relations in a transistor; concept of leakage current; CB, CE, CC configurations of a transistor; Input and output characteristics in CB and CE configurations; input and output dynamic resistance in CB and CE configurations; Current amplification factors, relation between α, β and γ. Comparison of CB, CE and CC Configurations; Transistor as an amplifier in CE Configuration; concept of DC load line and calculation of current gain and voltage gain using DC load line.

Transistor Biasing Circuits: Concept of transistor biasing and selection of operating point. Need for stabilization of operating point. Different types of biasing circuits. Single stage transistor amplifier circuit, concept of dc and ac load line and its use. Explanation of phase reversal of output voltage with respect to input voltage.

Field Effect Transistors: Construction, operation and characteristics of FETs and their applications, Construction, operation and characteristics of a MOSFET in depletion and enhancement modes and its applications, Comparison of JFET, MOSFET and BJT.

Statistics and Software

Statistics: Measures of Central Tendency: Mean, Median, Mode, Measures of Dispersion: Mean deviation, Standard deviation.

Software: SciLab software – Theoretical Introduction, Basic difference between MATLAB and SciLab software, Calculations with MATLAB or ScilLab - (a) Representation of matrix (2×2 order), (b) Addition, Subtraction of matrices (2×2 order) in MATLAB or SciLab.

Classification of Materials and their Properties

Definition of energy level, energy bands, Types of materials (conductor, semiconductor, insulator and dielectric) with examples, intrinsic and extrinsic semiconductors (introduction only), Introduction to magnetism, type of magnetic materials: diamagnetic, paramagnetic and ferromagnetic materials with examples, Magnetic field, magnetic lines of force, magnetic flux, Electromagnetic induction (definition).

Modern Physics

Laser: introduction, principle, absorption, spontaneous emission, stimulated emission, population inversion, Engineering and medical applications of laser, Fibre optics: introduction to optical fibres (definition, principle and parts), light propagation, fibre types (mono-mode, multi-mode), applications in medical, telecommunication and sensors 5.4 Nanotechnology: introduction, definition of nanomaterials with examples, properties at nanoscale, applications of nanotechnology (brief).

ELECTRONIC INSTRUMENTS AND MEASUREMENT

Basics of Instruments and Measurements: Measurement, method of measurement, types of instruments, Specifications of instruments: Accuracy, precision, sensitivity, resolution, range, errors in measurement, sources of errors, limiting errors, loading effect, importance and applications of standards and calibration.

Voltage, Current and Resistance Measurement Moving Coil and Moving Iron Instruments

a. Principles of measurement of DC voltage, DC current, AC voltage, AC current, b. Principles of operation and construction of permanent magnet moving coil (PMMC) instruments and Moving iron type instruments, VOM Meter.

Cathode Ray Oscilloscope: Construction and working of Cathode Ray Tube (CRT) Block diagram description of a basic CRO and triggered sweep oscilloscope, front panel controls Specifications of CRO and their Applications Measurement of current, voltage, frequency, time period and phase using CRO, Lissajous pattern for phase measurement. Digital storage oscilloscope (DSO): block diagram and working principle.

Impedance Bridges, Q Meter and Function Generator: a. Wheat stone bridge b. AC bridges: Maxwell's induction bridge, Hay's bridge, De-Sauty's bridge c. Block diagram and working principle of Q-meter. Explanation of block diagram, specifications of low frequency and RF generators, pulse generator, function generator.

Digital Instruments: a. Comparison of analog and digital instruments b. Block diagram and working of a digital multi-meter c. Applications and Limitations of digital multi-meters. d. Working principle of logic probe, logic pulser.

ENGINEERING GRAPHICS

Introduction to Engineering Drawing and Graphics: Introduction to use and care of drawing instruments, drawing materials, layout and sizes of drawing sheets and drawing boards, Symbols and conventions. a) Conventions of Engineering Materials, Sectional Breaks and Conventional lines. b) Civil Engineering Sanitary fitting symbols c) Electrical fitting symbols for domestic interior installations, Geometrical construction-geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagons, pentagons bisecting a line and arc, division of line and circle with the help of drawing instruments.

Technical Lettering of Alphabet and Numerals, Dimensioning, Scales, Orthographic Projections**,** Sectioning,Introduction of projection of right solids such as prism & pyramid, Introduction of sections of right solids,Development of Surfaces, Isometric Views, Introduction to AutoCAD.

Printed Circuit Board (PCB)

Introduction: What is PCB, Difference between PWB and PCB, Types of PCBs: Single/Double Sided and Multi-Layer PCBs, PCB Layer Masks: Top Layer Mask, Bottom Layer Mask, Solder Mask, Legend Print or Silk screen Mask, Hand-Taping Vs CAD PCB Materials: FR-2 and FR-4 material advantages and disadvantages, PCB Design Rules.

Computer Aided Design:

Brief History of EDA, Latest Trends in Market, How it helps and Why it requires, Different EDA Tools (Licensed like Orcad or Free Open Source Software like Circuit Maker or Dip Trace or Eagle etc.), Schematic Entry, Net listing, Electrical Rule Check (ERC), PCB Layout Designing, Auto and Manual Routing, Design Rule Check (DRC), Gerber Generation, Creating Library, Creating component, Symbols and Footprints for components.

Fabrication: Photo Processing for Pattern Transfer, Etching, Drilling, Component Mounting, Soldering and De-soldering, PCB Testing, PCB design and fabrication of Basic Analog Electronic Circuits, Power Supplies, 555 Based circuits etc.

ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT

Introduction: Basics of ecology, eco system- concept, and sustainable development, Sources, advantages, disadvantages of renewable and non-renewable energy, Rain water harvesting, Deforestation – its effects & control measures.

Air and Noise Pollution: Air Pollution: Source of air pollution. Effect of air pollution on human health, economy, Air pollution control methods, Noise Pollution: Source of noise pollution, Unit of noise, Effect of noise pollution, Acceptable noise level, Different method of minimizing noise pollution.

Water and Soil Pollution: Water Pollution: Impurities in water, Cause of water pollution, Source of water pollution. Effect of water pollution on human health, Concept of DO, BOD, COD. Prevention of water pollution- Water treatment processes, Sewage treatment. Water quality standard, Soil Pollution :Sources of soil pollution, Effects and Control of soil pollution, Types of Solid waste- House hold, Industrial, Agricultural, Biomedical, Disposal of solid waste, Solid waste management E-waste, E – waste management.

Impact of Energy Usage on Environment: Global Warming, Green House Effect, Depletion of Ozone Layer, Acid Rain. Eco-friendly Material, Recycling of Material, Concept of Green Buildings, Concept of Carbon Credit & Carbon footprint.

Disaster Management: Different Types of Disaster: Natural Disaster: such as Flood, Cyclone, Earthquakes and Landslides etc. Man-made Disaster: such as Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea Rail & Road), Structural failures (Building and Bridge), War & Terrorism etc., Disaster Preparedness: Disaster Preparedness Plan Prediction, Early Warnings and Safety Measures of Disaster Psychological response and Management (Trauma, Stress, Rumour and Panic).

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.

GROUP-04

Mechanic/ Operator cum Mechanic

(Level- Matric+ ITI Diesel Mechanic/ Aircraft Mechanic etc.)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc.- (**Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**. -**

(Weightage 10%)

3) Subject related syllabus- **(Weightage 70%)**

Occupational Safety & Health:

Importance of Safety and general Precautions to be observed in the shop. Basic first aid, safety signs for Danger, Warning, caution & personal safety message. Safe handling of Fuel Spillage, Fire extinguishers used for different types of fire. Safe disposal of toxic dust, safe handling and Periodic testing of lifting equipment, Authorization of Moving & road-testing vehicles. Electrical safety tips.

Hand & Power Tools:

Marking scheme, Marking material-chalk, Prussian blue. Cleaning tools- Scraper, wire brush, Emery paper, Description, care and use of Surface plates, steel rule, measuring tape, try square. Callipers-inside and outside. Dividers, surface gauges, scriber, punches-prick punch, centre punch, pin punch, hollow punch, number and letter punch. Chisel-flat, cross-cut. Hammer- ball pein, lump, mallet. Screw drivers-blade screwdriver, Phillips screw driver, Ratchet screwdriver. Allen key, bench vice & C-clamps, Spanners, ring spanner, open end spanner & the combination spanner, universal adjustable open-end spanner. Sockets & accessories, Pliers - Combination pliers, multi grip, long nose, flat-nose, Nippers or pincer pliers, Side cutters, Tin snips, Circlips pliers, external circlips pliers. Air impact wrench, air ratchet, wrenches- Torque wrenches, pipe wrenches, car jet washers Pipe flaring & cutting tool, pullers-Gear and bearing

Systems of measurement:

Description, care & use of - Micrometres- Outside and depth micrometre, Micrometre adjustments, Vernier callipers, Telescope gauges, Dial bore gauges, Dial indicators, straightedge, feeler gauge, thread pitch gauge, vacuum gauge, tire pressure gauge.

Drilling machine:

Description and study of Bench type Drilling machine, Portable electrical Drilling machine, drill holding devices, Work Holding devices, Drill bits. Taps and Dies: Hand Taps and wrenches, Calculation of Tap drill sizes for metric and inch taps. Different type of Die and Die stock. Screw extractors. Hand Reamers, Different Type of hand reamers, Drill size for reaming, Lapping, Lapping abrasives, type of Laps.

Basic electricity:

Electricity principles, Ground connections, Ohm's law, Voltage, Current, Resistance, Power, Energy. Voltmeter, ammeter, Ohmmeter Multi-meter, Conductors & insulators, Wires, Shielding, Length vs. resistance, Resistor ratings,Fuses & circuit breakers, Ballast resistor, Stripping wire insulation, cable colour codes and sizes, Resistors in Series circuits, Parallel circuits and Series-parallel circuits, Electrostatic effects, Capacitors and its applications, Capacitors in series and parallel, Description of Chemical effects, Batteries & cells, Lead acid batteries & Sealed Maintenance Free (SMF) batteries, Magnetic effects, Heating effects, Thermo-electric energy, Thermistors, Thermo-couples, Electrochemical energy, Photo-voltaic energy, Piezoelectric energy, Electromagnetic induction, Relays, Solenoids, Primary & Secondary windings, Transformers, stator and rotor coils, Basic electronics: Description of Semiconductors, Solid state devices- Diodes, Transistors.

Introduction to Hydraulics & Pneumatics:

Definition of Pascal law, pressure, Force, viscosity. Description, symbols and application in automobile of Gear pump Internal& External, single acting, double acting & Double ended cylinder; Pressure relief valve, non-return valve, Flow control valve used in automobile. Pneumatic Symbols, Description and function of air Reciprocating Compressor. Function of Air service unit (FRL-Filter, Regulator & Lubricator), Classification of vehicles on the basis of load as per central motor vehicle rule, wheels, final drive, and fuel used, axles, position of engine and steering transmission, body and load. Brief description and uses of Vehicle hoists – Two post and four post hoist, Engine hoists, Jacks, Stands

Introduction to Engine:

Description of internal & external combustion engines, Classification of IC engines, Principle & working of 2&4- stroke diesel engine (Compression ignition Engine (C.I)), Principle of Spark, Ignition Engine (SI), differentiate between 2- stroke and 4 stroke, C.I engine and S.I Engine, Direct injection and Indirect injection, technical terms used in engine, Engine specification, Different type of starting and stopping method of Diesel Engine Procedure for dismantling of diesel engine from a vehicle. Petrol Engine Basics: 4-stroke spark-ignition engines, Engine cams & camshaft, Engine power transfer, Scavenging, Piston components, Intake & exhaust systems, Gasoline Fuel Systems, Stoichiometric ratio, Air density, Fuel supply system, Type of Petrol and Diesel combustion chambers, Type of valve operating mechanism, Valve- timing diagram, concept of Variable valve timing, Timing belts & chains, Description & functions of different types of pistons, piston rings and piston pins and materials, common troubles and remedy. Compression ratio, Description & function of connecting rod, Description and function of Crank shaft, camshaft, Engine bearings, Description and function of the fly wheel and vibration damper, Crank case & oil pump, gears timing mark, Chain sprockets, chain tensioner etc. Function of clutch & coupling units attached to flywheel, Description of Cylinder block, Cylinder block construction, and Different type of Cylinder sleeves (liner),Need for Cooling systems, Heat transfer method, Vehicle coolant properties, Different type of cooling systems, Need for lubrication system, Functions of oil, Viscosity and its grade as per SAE, Oil additives, Synthetic oils, The lubrication system, Splash system, Pressure system, Lubrication system components, Intake system components Description and function of Air cleaners, Different type air cleaner, Exhaust system components,Diesel Fuel Systems Description and function of Diesel fuel injection, fuel characteristics, Emission Control:- Vehicle emissions Standards- Euro and Bharat II, III, IV, V Sources of emission, Types of emissions: Characteristics and Effect of Hydrocarbons, Hydrocarbons in exhaust gases, Oxides of nitrogen, Particulates, Carbon monoxide, Carbon dioxide, Sulphur content in fuels Description of Evaporation emission control, Catalytic conversion, closed loop, Crankcase emission control, Exhaust gas recirculation (EGR) valve, Controlling air fuel ratios, Charcoal storage devices, Diesel particulate filter (DPF). Selective Catalytic Reduction (SCR), EGR VS SCR, Description. of charging circuit operation of alternators, regulator unit, ignition warning lamp troubles and remedy in charging system. Description of starter motor circuit, Constructional details of starter motor solenoid switches, common troubles and remedy in starter circuit, Troubleshooting: Causes and remedy for Engine Not starting – Mechanical & Electrical causes, High fuel consumption, Engine overheating, Low Power Generation, Excessive oil consumption, Low/High Engine Oil Pressure, Engine Noise.

Workshop Calculation & Science:

Unit, Fractions Classification of unit system Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units Measurement units and conversion Factors, HCF, LCM, Applications of Pythagoras theorem and related problems Ratio and proportion Ratio and proportion - Direct and indirect proportions Percentage - Changing percentage to decimal and fraction, Mass, Weight, Volume and Density Mass, Related problems, Work, power, energy, HP, IHP, BHP and efficiency Potential energy, kinetic energy, Heat & Temperature and Pressure Concept of heat and temperature, effects of heat, difference between heat and temperature, boiling point & melting point, Scales of temperature, Celsius, Fahrenheit, kelvin and conversion between scales of temperature Heat &Temperature - Temperature measuring instruments, types of thermometer, pyrometer and transmission of heat - Conduction, convection and radiation. Mensuration Area and perimeter of square, rectangle, Triangles, circle, semi-circle, circular ring, sector of circle, volume of solids - cube, cuboid, cylinder, sphere and hollow cylinder.

Introduction: Study of different major components of vehicle

Clutches & Manual Transmissions-Clutch principles, Manual transmissions Automated Manual Transmission (AMT), Final Drive & Drive Shafts - Basic layouts Front-wheel drive layout, Rear-wheel drive

layout, Four-wheel drive layout, All wheel drive layout, 4WD v/s AWD Front-wheel drive, Automatic Transmissions, Hydraulic system & controls, Steering Systems, Suspension Systems, Lubrication system, Wheels & Tyres-Wheel types, Braking systems, Importance of Diagnostic Trouble Code (DTC), Ignition principles and Faraday's laws, Charging system, Starting system, Accessories: Horn circuit, wiper circuit, power window components and circuit. Power door lock circuit, automatic door lock circuit, remote keyless entry system circuit, antitheft system, immobilizer system. Description and function of Airbags, Seatbelt, Vehicle safety systems, Crash sensors, Seat belt pretensioners, Tire pressure monitoring systems Integrated communications, Proximity sensors, Introduction to Hybrid & Electronic vehicle, Hydrogen fuel cell vehicle, Heating Ventilation Air Conditioning (HVAC) legislation, Vehicle heating, ventilation & cooling systems, Introduction to Electric Vehicle Technology, EV Terminology Comparison of Electric Vehicle with IC engine vehicle based on emissions, range, fuel type. Types of electric vehicle, BEV, HEV, PHEV and FCEV,

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.

GROUP-05

Fitter/ Turner (Level- ITI Certificate in Fitter/ Turner/ Mechanical Trade)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc.-

(Weightage 20%)

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc. -

(Weightage 10%)

3) Subject related syllabus- (**Weightage 70%)**

Professional Skill

Soft Skills, its importance, Importance of safety and general precautions observed in the in the industry/shop floor. Introduction of First aid. Operation of electrical mains and electrical safety. Introduction of PPEs. Response to emergencies e.g.; power failure, fire, and system failure, Importance of housekeeping & good shop floor practices. Introduction to 5S concept & its application, **Occupational Safety & Health:** Health, Safety and Environment guidelines, legislations &regulations as applicable. Basic understanding on Hot work, confined space work and material handling equipment,Linear measurements - its units, dividers, callipers, hermaphrodite, centre punch, dot punch, prick punch their description and uses of different types of hammers. Description, use and care of 'V' Blocks, marking off table. Measuring standards (English, Metric Units), angular measurements,Bench vice construction, types, uses, care & maintenance, vice clamps, hacksaw frames and blades, specification, description, types and their uses, method of using hacksaws. Files - specifications, description, materials, grades, cuts, file elements, uses. Types of files, care and maintenance of files. Measuring standards (English, Metric Units), angular measurements,marking off and layout tools, dividers, scribing block, - description, classification, material, care & maintenance. Try square, ordinary depth gauge, protractor - description, uses and cares. Uses, care & maintenance of cold chisels - materials, types, cutting angles, marking media, marking blue, Prussian blue, red lead, chalk and their special application,description, Use, care and maintenance of scribing block. Surface plate and auxiliary marking equipment, 'V' block, angle plates, parallel block, description, types, uses, accuracy, care and maintenance.

Physical properties of engineering metal: colour, weight, structure, and conductivity, magnetic, fusibility, specific gravity.

Mechanical properties: ductility, malleability hardness, brittleness, toughness, tenacity, and elasticity.**Power Saw,** band saw, Circular saw machines used for metal cutting.

Micrometre- outside and inside – principle, constructional features, parts graduation, reading, use and care. Micrometre depth gauge, parts, graduation, reading, use and care. Digital micrometre, **Vernier callipers,** principle, construction, graduations, reading, use and care. Vernier bevel protractor, construction, graduations, reading, use and care, dial Vernier Calliper, Digital Vernier calliper, Vernier height gauge: material construction, parts, graduations (English & Metric) use, care and maintenance, **Drilling processes:** common type (bench type, pillar type, radial type), gang and multiple drilling machine. Determination of tap drill size.

Sheet Metal Operations-Safety precautions to be observed in a sheet metal workshop, sheet and sizes, Commercial sizes and various types of metal sheets, coated sheets and their uses as per BIS specifications. Shearing machine- description, parts and uses, Marking and measuring tools, wing compass, tin man's square tools, snips, types and uses. Tin man's hammers and mallets type-sheet metal tools, types, specifications, uses. Trammel- description, parts, uses. Hand grooves, specifications and uses. Sheet and wire gauge, Stakes-bench types, parts, their uses. Various types of metal joints, their selection and application, tolerance for various joints, their selection& application. Wired edges, Solder and soldering: Introduction-types of solder and flux. Composition of various types of solder and their heating media of soldering iron. Method of soldering, selection and application-joints. Hard solder, Introduction, types and method of brazing.

Various rivets shape and form of heads, importance of correct head size. Rivets-Tin man's rivets types, sizes, and selection for various works. Riveting tools, dolly snaps description and uses. Method of riveting, The spacing of rivets. Flash riveting, use of correct tools, compare hot and cold riveting.

Safety-importance of safety and general precautions observed in a welding shop. Precautions in electric and gas welding. (Before, during, after) Introduction to safety equipment and their uses. Machines and accessories, welding transformer, welding generators.

Welding hand tools: Hammers, welding description, types and uses, description, principle, method of operating, carbon dioxide welding. H.P. welding equipment: description, principle, method of operating L.P. welding equipment: description, principle, method of operating. Types of Joints-Butts and fillet as per BIS SP: 46-1988 specifications. Gases and gas cylinder description, kinds, main difference and uses, Setting up parameters for ARC welding machines-selection of Welding electrodes. Care to be taken in keeping electrode, Oxygen acetylene cutting, machine description, parts, uses, method of handling, cutting torch-description, parts, function and uses.

Drill- material, types, (Taper shank, straight shank) parts and sizes. Drill angle-cutting angle for different materials, cutting speed feed. R.P.M. for different materials. Drill holding devices- material, construction and their uses, Counter sink, counter bore and spot facing-tools and nomenclature, Reamer, material, types (Hand and machine reamer), kinds, parts and their uses, determining hole size (or reaming), Reaming procedure.

Screw threads: terminology, parts, types and their uses. Screw pitch gauge: material parts and uses. Taps British standard (B.S.W., B.S.F., B.A. & B.S.P.) and metric /BIS (coarse and fine) material, parts (shank body, flute, cutting edge).

Tap wrench: material, parts, types (solid &adjustable types) and their uses removal of broken tap, studs (tap stud extractor). Dies: British standard, metric and BIS standard, material, parts, types, Method of using dies. Die stock: material, parts and uses.

Drill troubles: causes and remedy. Equality of lips, correct clearance, dead centre, length of lips. Drill kinds: Fraction, metric, letters and numbers, grinding of drill.

Grinding wheel: Abrasive, grade structures, bond, specification, use, mounting and dressing. Selection of grinding wheels. Bench grinder parts and use.

Gauges- Introduction, necessity, types. Limit gauge: Ring gauge, snap gauge, plug gauge, description and uses. Description and uses of gauge types (feeler, screw, pitch, radius, wire gauge).

Interchange ability: Necessity in Engg., field definition, BIS. Definition, types of limits, terminology of limits and fits, basic size, actual size, deviation, high and low limit, zero-line, tolerance zone Different standard systems of fits and limits. British standard system, BIS system.

Method of expressing tolerance as per BIS Fits: Definition, types, description of each with sketch. Vernier height gauge: material construction, parts, graduations (English & Metric) use, care and maintenance

Pig Iron: types of pig Iron, properties and uses. Cast Iron: types, properties and uses, wrought iron: - properties and uses. Steel: plain carbon steels, types, properties and uses. Non-ferrous metals (copper, aluminium, tin, lead, zinc) properties and uses.

Simple scraper- flat, half round, triangular and hook scraper and their uses. Blue matching of scraped surfaces (flat and curved bearing surfaces). Testing scraped surfaces: ordinary surfaces without a master plate.

Vernier micrometre, material, parts, graduation, use, care and maintenance. Calibration of measuring instruments. Introduction to mechanical fasteners and its uses. Screw thread micrometre: Construction, graduation and use.

Dial test indicator, construction, parts, material, graduation, Method of use, care and maintenance. Digital dial indicator. Comparators measurement of quality in the cylinder bores.

Lathe-Safely precautions to be observed while working on a lathe, Lathe specifications, and constructional features. Lathe main parts descriptions- bed, head stock, carriage, tail stock, feeding and thread cutting mechanisms. Holding of job between centres, works with catch plate, dog, simple description of a facing and roughing tool and their applications.

Lathe cutting tools- Nomenclature of single point & multipoint cutting tools, Tool selection based on different requirements and necessity of correct grinding, solid and tipped, throw away type tools, cutting speed and feed and comparison for H.S.S., carbide tools. Use of coolants and lubricants.

Chucks and chucking the independent four-jaw chuck. Reversible features of jaws, the back plate, Method of clearing the thread of the chuck-mounting and dismounting, chucks, chucking true, face plate, drilling - method of holding drills in the tail stock, Boring tools and enlargement of holes.

General turning operations-parallel or straight, turning. Stepped turning, grooving, and shape of tools for the above operations. Appropriate method of holding the tool-on-tool post or tool rest, Knurling: - tools description, grade, uses, speed and feed, coolant for knurling, speed, feed calculation. Taper – definition, use and method of expressing tapers. Standard tapers-taper, calculations Morse taper.

Screw thread definition – uses and application. Square, worm, buttress, acme (nonstandard-screw threads), Principle of cutting screw thread in centre lathe – principle of chasing the screw thread – use of centre gauge, setting tool for cutting internal and external threads, use of screw pitch gauge for checking the screw thread.

Assembling techniques such as aligning, bending, fixing, mechanical jointing, threaded jointing, sealing, and torquing. Dowel pins: material, construction, types, accuracy and uses.

Screws: material, designation, specifications, Property classes (e.g., 9.8 on screw head), Tools for tightening/ loosening of screw or bolts, Torque wrench, screw joint calculation uses. Power tools: its constructional features, uses & maintenance.

Locking device: Nuts- types (lock nut castle nut, slotted nuts, swam nut, grooved nut) Description and use. Various types of keys, allowable clearances & tapers, types, uses of key pullers.

Special files: types (pillar, Dread naught, Barrow, warding) description & their uses.

Templates and Radius/fillet gauge, feeler gauge, hole gauge, and their uses, care and maintenance.

Slip gauge: Necessity of using, classification & accuracy, set of blocks (English and Metric). Details of slip gauge. Metric sets 46: 103: 112. Wringing and building up of slip gauge and care and maintenance.

Application of slip gauges for measuring, Sine Bar-Principle, application & specification. Procedure to check adherence to specification and quality standards.

Lapping: Application of lapping, material for lapping tools, lapping abrasives, charging of lapping tool. Surface finish importance, equipment for testing-terms relation to surface finish. Equipment for tasting surfaces quality – dimensional tolerances of surface finish.

Honing: Application of honing, material for honing, tools shapes, grades, honing abrasives. Frosting- its aim and the methods of performance.

Gauges and types of gauges commonly used in gauging finished product-Method of selective assembly 'Go' system of gauges, hole plug basis of standardization.

Bearing-Introduction, classification (Journal and Thrust), Description of each, ball bearing: Single row, double row, description of each, and advantages of double row.

Roller and needle bearings: Types of rollers bearing, Description & use of each. Method of fitting ball and roller bearings.

Bearing metals – types, composition and uses. Synthetic materials for bearing: The plastic laminate materials, their properties and uses in bearings such as phenolic, Teflon polyamide (nylon).

Pipes and pipe fitting- commonly used pipes. Pipe schedule and standard sizes. Pipe bending methods. Use of bending fixture, pipe threadsStd. Pipe threads Die and Tap, pipe vices.

Use of tools such as pipe cutters, pipe wrenches, pipe dies, and tap, pipe bending machine etc.

Standard pipe fitting- Methods of fitting or replacing the above fitting, repairs and erection on rainwater drainage pipes and household taps and pipe work. Inspection & Quality Control-Basic SPC - Visual Inspection.

Drilling jig-constructional features, types and uses. Fixtures-Constructional features, types and uses.

Power transmission elements. The object of belts, their sizes and specifications, materials of which the belts are made, selection of the type of belts with the consideration of weather, load and tension methods of joining leather belts.

Vee belts and their advantages and disadvantages, use of commercial belts, dressing and resin creep and slipping, calculation. Power transmissions coupling types-flange coupling, -Hooks coupling, universal coupling and their different uses. Pulleys-types-solid, split and 'V' belt pulleys, standard calculation for determining size crowning of faces -loose and fast pulleys -jockey pulley. Types of drives -open and cross belt drives. The geometrical explanation of the belt drivers at an angle. Clutch: Type, positive clutch (straight tooth type, angular tooth type). Chains, wire ropes and clutches for power transmission. Their types and brief description.

Power transmission –by gears, most common form spur gear, set names of some essential parts of the set -The pitch circles, Diametral pitch, velocity ratio of a gear set, Helical gear, herring bone gears, bevel gearing, spiral bevel gearing, hypoid gearing, pinion and rack, worm gearing, velocity ratio of worm gearing. Repair of gear teeth by building up and dovetail method, Method or fixing geared wheels for various purpose drives. General cause of the wear and tear of the toothed wheels and their remedies, method of fitting spiral gears, helical gears, bevel gears, worm and worm wheels in relation to required drive. Care and maintenance of gears.

Fluid power, Pneumatics, Hydraulics and their comparison, Overview of a pneumatic system, Boyle's law. Overview of an industrial hydraulic system, Applications, Pascal's Law.

Compressed air generation and conditioning, Air compressors, Pressure regulation, Dryers, Air receiver, Conductors and fittings, FRL unit, Applications of pneumatics, Hazards & safety precautions in pneumatic systems, Pneumatic actuators: - Types, Basic operation, Force, Stroke length, Single-acting and double-acting cylinders.

Pneumatic valves:- Classification, Symbols of pneumatic components, 3/2- way valves (NO & NC types) (manually-actuated & pneumatically-actuated) & 5/2-way valves, Check valves, Flow control valves, One-way flow control valve Pneumatic valves: Roller valve, Shuttle valve, Twopressure valve Electro-pneumatics: Introduction, 3/2-way single solenoid valve, 5/2-way single solenoid valve, 5/2-way double solenoid valve, Control components - Pushbuttons (NO & NC type) and Electromagnetic relay unit, Logic controls.

Symbols of hydraulic components, Hydraulic oils –function, properties, and types, Contamination in oils and its control - Hydraulic Filters – types, constructional features, and their typical installation locations, cavitation, Hazards & safety precautions in hydraulic systems - Hydraulic reservoir & accessories, Pumps, Classification – Gear/vane/ piston types, Pressure relief valves – Direct acting and pilot-operated types - Pipes, tubing, Hoses and fittings – Constructional details, Minimum bend radius, routing tips for hoses, valves and Pilot-operated check valves, Load holding function - Flow control valves: Types, Speed control methods – meter-in and meter-out - Preventive maintenance & troubleshooting of pneumatic & hydraulic systems, System malfunctions due to contamination, leakage, friction, improper mountings, cavitation, and proper sampling of hydraulic oils.

Method of lubrication-gravity feed, force (pressure) feed, splash lubrication. Cutting lubricants and coolants: Soluble off soaps, suds, paraffin, soda water, common lubricating oils and their commercial names, selection of lubricants. Washers-Types and calculation of washer sizes. The making of joints and fitting packing, Lubrication and lubricants, purpose of using different types, description and uses of each type. Method of lubrication. A good lubricant, viscosity of the lubricant, Main property of lubricant. How a film of oil is formed in journal Bearings.

Foundation bolt: types (Lewis's cotter bolt) description of each erection tools, pulley block, crowbar, spirit level, Plumb bob, wire rope, manila rope, wooden block. The use of lifting appliances, extractor presses and their use. Practical method of obtaining mechanical advantage. The slings and handling of heavy machinery, special precautions in the removal and replacement of heavy parts.

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.

GROUP-06-Draughtsman (Electrical)

Level- 2 Years Diploma in Draughtsman (Electrical)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc.- (**Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**. -**

(Weightage 10%)

3) Subject related syllabus- (Weightage 70%)

Importance of safety and general precautions observed in the in the industry/shop floor, working of Industrial Training Institute system including stores procedures. Soft Skills: its importance and Job area after completion of training, Introduction of First aid, Introduction of PPEs, Introduction to 5S concept& its application, Response to emergencies e.g.; power failure, fire alarm, etc.

Familiarisation& information about rules and regulations of the Institute and Trade, List of the Instruments, equipment's and materials to be used during training.

Importance of B.I.S. Introduction of Code for practice of Architectural and Building Drawings (IS: 962-1989, SP-46:2003), Layout of drawing. Lines, Lettering, Dimensioning, Knowledge of different types of scale. Principle of R.F.

Basic Concepts

Concepts of resistance, inductance, capacitance, and various factors affecting them.• Concepts of current, voltage, power, energy and their units.• Network elements: ideal voltage and current sources, dependent sources, R, L, C, M elements; Network solution methods: KCL, KVL, Node and Mesh analysis; • Network Theorems: Thevenin's, Norton's, Superposition and Maximum Power Transfer theorem; • Magnetic Circuit – Concepts of flux, mmf, reluctance, Different kinds of magnetic materials, Magnetic calculations for conductors of different configurations e.g., straight, circular, solenoidal, etc.• Electromagnetic induction, self and mutual induction.• Transient response of dc and ac networks, sinusoidal steady-state analysis, resonance, two port networks, balanced three phase circuits, star-delta transformation, complex power and power factor in ac circuits.• Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss's Law, Divergence, Electric field and potential due to point, line, plane and spherical charge distributions, Effect of dielectric medium, Capacitance of simple configurations, Biot-Savart's law, Ampere's law, Curl, Faraday's law, Lorentz force, Inductance, Magnetomotive force, Reluctance, Magnetic circuits, Self and Mutual inductance of simple configurations.

AC Fundamentals

• Instantaneous, peak, R.M.S. and average values of alternating waves.• Representation of sinusoidal waveform, simple series and parallel AC Circuits consisting of R.L. and C, Resonance, Tank Circuit.• Poly Phase system – star and delta connection, 3 phase power, DC and sinusoidal response of R-Land R-C circuit.

Measurement and Measuring Instruments

• Measurement of power (1 phase and 3 phase, both active and reactive) and energy, 2 wattmeter method of 3 phase power measurement.• Measurement of frequency and phase angle.• Ammeter and voltmeter (both moving oil and moving iron type), extension of range wattmeter, Multi-meter, Megger, Energy meter AC Bridges.• Use of CRO, Signal Generator, CT, PT and their uses.• Earth Fault detection.

Signals and Systems

• Representation of continuous and discrete time signals, shifting and scaling properties, linear time invariant and causal systems, Fourier series representation of continuous and discrete time periodic signals, sampling theorem, Applications of Fourier Transform for continuous and discrete-time signals, Laplace Transform and Z transform

Electrical Machines

• Single-phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; • Three-phase transformers: connections, vector groups, parallel operation; • Auto-transformer, Electromechanical energy conversion principles; • DC machines: separately excited, series and shunt, motoring and generating mode of operation and their characteristics, speed control of dc motors; • Three-phase induction machines: principle of operation, types, performance, torque-speed characteristics, no-load and blocked-rotor tests, equivalent circuit, starting and speed control; • Operating principle of single-phase induction motors; Synchronous machines: cylindrical and salient pole machines, performance and characteristics, regulation and parallel operation of generators, starting of synchronous motors;

• Types of losses and efficiency calculations of electric machines• Methods of braking, effect of voltage and frequency variation on torque speed characteristics.

Fractional Kilowatt Motors and Single-Phase Induction Motors

• Characteristics and applications.• Synchronous Machines – Generation of 3-phase e.m.f. armature reaction, voltage regulation, parallel operation of two alternators, synchronizing, control of active and reactive power.• Starting and applications of synchronous motors.

Power Systems

• Basic concepts of electrical power generation, ac and dc transmission concepts, Models and performance of transmission lines and cables, • Series and shunt compensation, Electric field distribution and insulators, • Distribution systems, Per-unit quantities, Bus admittance matrix, Gauss-Seidel and Newton-Raphson load flow methods, Voltage and Frequency control, Power factor correction, Symmetrical components, Symmetrical and unsymmetrical fault analysis, Principles of over-current, differential, directional and distance protection;• Circuit breakers, System stability concepts, Equal area criterion, Economic Load Dispatch (with and without considering transmission losses).

Control Systems

• Mathematical modelling and representation of systems, • Feedback principle, transfer function, • Block diagrams and Signal flow graphs, • Transient and Steady-state analysis of linear time-invariant systems, • Stability analysis using Routh-Hurwitz and Nyquist criteria, Bode plots, Root loci, Lag, Lead and Lead-Lag compensators; • P, PI and PID controllers; State-space model, Solution of state equations of LTI systems, R.M.S. value, average value calculation for any general periodic waveform.

Generation, Transmission and Distribution

• Power factor improvement, various types of tariffs, types of faults, short circuit current for symmetrical faults. • Switchgears – rating of circuit breakers, Principles of arc extinction by oil and air, H.R.C. Fuses, Protection against earth leakage / over current, etc. Buchholz's relay, Merz-Price system of protection of generators & transformers, protection of feeders and bus bars. • Lightning arresters, various transmission and distribution system, comparison of conductor materials, the efficiency of different system. • Cable – Different type of cables, cable rating and derating factor. • Different types of power stations, Load factor, diversity factor, demand factor, cost of generation, inter-connection of power stations.

Estimation and Costing

• Estimation of lighting scheme, electric installation of machines and relevant IE rules. • Earthing practices and IE Rules.

The Utilisation of Electrical Energy

• Illumination • Electric heating • Electric welding • Electroplating • Electric drives and motors.

Basic Electronics

• Working of various electronic devices e.g., P N Junction diodes, Transistors (NPN and PNP type) BJT and JFET. • Simple circuits using these devices. • Static V-I characteristics and firing/gating circuits for

Thyristor, MOSFET, IGBT; • DC to DC conversion: Buck, Boost and Buck-Boost Converters; • Single and three-phase configuration of uncontrolled rectifiers; • Voltage and Current commutated Thyristor based converters; • Bidirectional ac to dc voltage source converters; • Magnitude and Phase of line current harmonics for uncontrolled and thyristor based converters; • Power factor and Distortion Factor of ac to dc converters; • Single-phase and three-phase voltage and current source inverters, sinusoidal pulse width modulation.

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.

GROUP-07

Draughtsman (Mechanical)- LEVEL- Matric+ Dip. in Draughtsman (Mech.)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc.-

(Weightage 20%)

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc.-

(Weightage 10%)

3) Subject related syllabus- **(Weightage 70%)**

Professional Skill

Soft Skills: its importance and Job area after completion of training. Introduction of First aid. Operation of electrical mains. Introduction of PPEs. Introduction to 5S concept & its application. Response to emergencies e.g., power failure, fire, and system failure,Nomenclature, description and use of drawing instruments & various equipment used in drawing office. Their care and maintenance Lay out and designation of a drawing sheet as per Sp -46: 2003 Recommended scale of engineering drawing as per Sp -46: 2003 Types of Lines and their application. Folding of prints for filing Cabinets or binding as per SP: 46-2003, Type of lettering proportion and spacing of letters and words, Definition of ellipse, parabola, hyperbola, different methods of their construction. Definition & method of drawing involutes cycloid curves, helix & spiral,Terminology – feature, functional feature, functional dimension, datum dimension, principles. Units of dimensioning, System of dimensioning, Method of dimensioning & common features, Methods of obtaining orthographic view. Position of the object, selection of the views, three views of drawing. Planes and their normal projections, Orthographic projection. First angle and third angle projection. Principal of orthographic projection. Projection of solids like prism, cones, pyramids and their frustums, Methods of free hand sketching for machine parts, Knowledge of different types of scales, scale of cords, their appropriate uses, Principle of R.F, diagonal &vernier, Knowledge of solid section. Types of sectional views & their uses. Cutting plane and its representation. Parts not shown in section. Conventional signs, symbols, abbreviations & hatching for different materials. Solution of problems to find out the true shape of surfaces when solids are cut by different cutting planes, Definition of development, its need in industry & different method of developing the surfaces. Development of surfaces bounded by plane of revolution intersecting each other. Development of an oblique cone with elliptical base etc., Calculation of developed lengths of geometrical solids, Definition of Intersection & interpenetration curves. Common method to find out the curve of interpenetration. Solution of problems on interpenetration of prism, cones, & pyramids with their axes intersecting at an angle. Intersection of cylinder, Principle of isometric projection and Isometric drawing. Methods of isometric projection and dimensioning. Isometric scale. Difference between Isometric drawing & Isometric projection,Principles of making orthographic views from isometric drawing. Selection of views for construction of orthographic drawings for clear description of the object,Principle and types of oblique projection. Advantage of oblique projection over isometric. Projection,

Different types of fasteners, welds and locking devices

Screw threads, terms nomenclature, types of screw thread, proportion and their uses, threads as per SP46:2003 conventions. Types of bolts, nuts and studs, and their proportion, uses. Different types of locking devices. Different types of machine screws, cap screws, set screws as per specification. Different types of foundation bolts and their uses, Description of Welded Joints and their representation (Actual and Symbolic) Indication of Welding Symbol on drawing as per SP-46, Different types of keys (Heavy duty and Light duty) cotters, splined shaft, pins and circlips. Calculation of sizes and proportions of keys, Pipe Joints: selection of materials as per carrying fluid and conditions. Description of different pipe joints fitted on pipe. Expansion joint, loop and other pipe fittings, Types of rivets, their size proportions and uses. Types of riveted joints, terms and proportions of riveted joints. Conventional representation. Relation between rivet size and thickness of plates and calculation for arrangement of rivets position. Causes of failure of riveted joint efficiency of riveted joints.

Tools and equipment and their application in Allied trades

Description and application of simple measuring tools. Description of vices, hammers, cold chisel, files, drills, etc.- proper method of using them. Method of using precision measuring instrument. Maintaining

sequence of operation in fitting shop and safety precaution, Safety precaution for lathes,Description of parts of Lathe & its accessories. Method of using precision measuring instrument such as inside & outside micrometres, depth gauges, vernier callipers, dial indicators, slip gauges, sine bars, universal bevel protractor, etc., Brief Description of milling, shaping, slotting and planning machines. Quick return mechanism of these machines. Maintaining sequence of operation in machine shop and safety precaution, Brief description of common equipment required for sheet metal work. Different types of joints used in sheet metal work, Maintaining sequence of operation in machine shop and safety precaution. Brief description of the hand tools used gas & arc welding. Different types of welded joints and necessary preparation required for these. Safety precautions, Hand tools used for molding. The description, use and care of Safety precaution maintained in electrician shop. A.C & D.C Motors Generators of common types and their uses and brief description of common equipment necessary for sheet metal work. Electrical units and quantities. Laws of electricity. Simple examples of calculation of current voltage, resistance in series and parallel connection (D.C. Circuit). Brief description of internal combustion engines, such as cylinder block piston, carburettor spark plug, camshaft, crank shaft, injector fuel pump etc.,

Different types of gears, couplings and bearings with tolerance dimension and indicating surface finish symbol

Limits, fit, tolerance. Tolerance dimensioning, geometrical tolerance. Indications of symbols for machining and surface finishes on drawing (grades and micron values) Production of interchangeable parts, geometrical tolerance. Familiarization with IS: 919, IS:2709, Couplings, necessity of coupling, classification of couplings. Uses and proportion of different types of couplings. Materials used for couplings, Knowledge of bearing to reduce friction, types of bearing, frictional and anti-frictional bearings. Material used for frictional bearings. Properties of frictional bearing (sliding bearing) materials. Parts of anti-frictional bearings (ball, roller, thrust ball, needle & taper roller). Materials and proportion of parts. Difference between frictional and anti-frictional bearings. Advantages of anti-frictional bearings, Gears and gear drives- uses, types, nomenclature and tooth profiles.

Computer Application in Drawings

Introduction to computer, Windows operating system,file management system. Computer hardware and software specification. Knowledge of installation of application software,Introduction to CAD Advantages of using CAD, CAD main Menu, screen menu, command line, model space, layout space. Drawing layouts, Tool bars, File creation, Save, Open existing drawings, creation of Drawing Sheet as per ISO, Absolute Co-ordinate system , Polar Co-ordinate System and Relative Co-ordinate System Create Line, Break, Erase, Undo.

WORKSHOP CALCULATION & SCIENCE:

Unit, Fractions Classification of unit system Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units Measurement units and conversion Factors, HCF, LCM and problems Fractions - Addition, subtraction, multiplication & division Decimal fractions - Addition, subtraction, multiplication & division Solving problems by using calculator Square root, Ratio and Proportions, Percentage Square and square root Simple problems using calculator Applications of Pythagoras theorem and related problems Ratio and proportion Ratio and proportion - Direct and indirect proportions Percentage - Changing percentage to decimal and fraction,Material Science:Types metals, types of ferrous and nonferrous metals Physical and mechanical properties of metals Introduction of iron and cast iron Difference between iron & steel, alloy steel and carbon steel Properties and uses of rubber, timber and insulating materials Mass, Weight, Volume and Density Mass, volume, density, weight and specific gravity Heat & Temperature and Pressure Concept of heat and temperature, effects of heat, difference between heat and temperature, boiling point & melting point of different metals and non-metals Mensuration Area and perimeter of square, rectangle and parallelogram Area and perimeter of Triangles Area and perimeter of circle, semi-circle, circular ring, sector of circle, hexagon and ellipse Surface area and volume of solids - cube, cuboid, cylinder, sphere and hollow cylinder Finding the lateral surface area, total surface area and capacity in litres of hexagonal, conical and cylindrical shaped vessels Trigonometry Measurement of angles Trigonometrical ratios Trigonometrical tables. Centre of Gravity Centre of gravity - Centre of gravity and its practical application Area of cut out regular surfaces and area of irregular surfaces Area of cut out regular surfaces - circle, segment and sector of circle Related problems of area of cut out regular surfaces - circle, segment and sector of circle Area of irregular surfaces and application related to shop problems

Estimation and Costing Estimation and costing - Simple estimation of the requirement of material etc., as applicable to the trade Estimation and costing - Problems on estimation and costing.

Projection views of geometrical figures with dimension and annotation on CAD

Drawing of Line, polyline, ray, polygon, circle, rectangle, arc, ellipse using different options, Trim, Offset, Fillet, Chamfer, Arc and Circle under modify commands. Move, Copy, Array, Insert Block, Make Block, Scale, Rotate, Hatch Commands, creating templates, inserting drawings, Layers, Modify Layers, Format dimension style, creating new dimension style, Modifying styles in dimensioning. Writing text on dimension line and on leader, Edit text dimension, Knowledge of shortcut keyboard command. Customization of keyboard command. Customization of drafting, settings, changing orthographic snap to isometric snap. Procedure to create viewport in layout space in zooming scale.

Machine parts viz., Pulleys, Pipe fittings, Gears and Cams

Belt-drive. Materials of belts, slip and creep, Velocity of belt. Arc of contact. Simple exercise in calculation of belt speeds, nos. of belts needed in V-belt drive, velocity, pulley ratio etc. Standard pulleys width of pulley face, velocity ratio chain drive, Knowledge of different pipe materials and specifications of Steel, W.I. & PVC pipes. Brief description of different types of pipe joints. Pipe threads. Pipe fittings (threaded, welded and pressed). Specifications of pipe fittings. Different types of valves, Gear drive-Different types of gears. Cast gears and machined gears. Knowledge of profile of gears etc., Use of Cams in industry. Types of cams, kinds of motion in cam, displacement diagrams. Terms used in cam. Types of followers.

Engine parts with detailed and assembly in template layout

Knowledge of engine mechanism. Transmission of motion from reciprocating to circular through eccentric, crank and connecting rod, Knowledge of fuel injection system in petrol and diesel engine, Introduction to 3D modelling, 3D primitives (viz. box, sphere, cylinder, mesh and poly-solids), solid figure by extrude, revolve, sweep and loft command, solid editing: fillet, offset, taper, shell and slice command. Setting of User co-ordinate Systems, Rotating, Print preview and Plotting.

Tools & Mechanical systems

Working principle of valves and their description, Knowledge of simple stationary fire tube boiler, boiler mountings. Function and purpose of blow off cock, Brief description of a typical hydraulic system, components, working principle and function of hydraulic jack. Different types of hydraulic actuator. Symbol and working of hydraulic DC valve, non-return valve and throttle valve, Knowledge of typical pneumatic system, FRL or air service unit and pneumatic actuator, Different types of pump systems. Characteristics of a pump system: pressure, friction and flow. Energy and head in pump systems,Different clamping devices on lathe, Description of different job holding devices in lathe operation, Different clamping devices on milling operation, Different clamping devices on shaping operation,Knowledge of accuracy and interchangeability in the manufacturing of products,Knowledge of various parts of press tools and their function, Knowledge of different moulding processes. Introduction to Die casting, gating system design, force calculation, defects and remedies and estimation,Description of different parts of petrol engine, Knowledge of design,manufacture, and operation of pressure vessels, Proper measurement practice in workshop. Principles of good measurement result: right measurement, right tools, right sketching, review and right procedures, Lay out of Machine foundations. Brief treatment of the principle Involved and the precautions to be observed. Lay out of machine Foundation. Consideration of ergonomics (human factor) for shop layout.

Solid Works/AutoCAD Inventor/ 3D Modelling:

Introduction to Solid Works/ AutoCAD Inventor/ 3D Modelling User interface - Menu Bar – Command manager – Feature manager – Design Tree – settings on the Default options – suggested settings – key board short cuts. Create the best profile – create a sketch – create a new part, extrude bosses and cuts, add fillets, and chamfer changing dimensions. Revolved features using axes, circular patterning changes and Rebuild problems, bottom-up assembly modelling Components configuration in an assembly, insert subassemblies, Interference detection, Drawings & Detailing, create drawing sheets, add drawing items, Named views, std. 3 views, auxiliary views, section views, detail views. Drawings & Detailing, create drawing sheets, add drawing items, Named views, standard 3 views, auxiliary views, section views, detail views, Difference between sweep and loft. Exploded views – Configuration manager, Animation

controller. Annotating Holes and Threads, Creating Centrelines, symbols and leaders, Simulation. Introduction to plot & Different ways of plotting,Knowledge of production drawing, name plate and bill of materials, etc. Study of production drawing. Procedure of preparing Revision Drawing: putting revision mark, writing remarks in the table as per check list.

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.

GROUP-08

Assistant Archaeologist (Level of Exam- M.A. in Ancient Indian History)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc. - (**Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**. -**

(Weightage 10%)

3) Subject related syllabus- (Weightage 70%)

Historical Geography of Early India

Early developments in historical geography, Geographical issues in early Indian literature, Epics and Archaeological Tradition, Historical Geography of Ashokan Sites, Chinese sources and Buddhist Archaeology.

Archaeological Background to the Study of Indian History

Archaeology, Development of Archaeology, Nature of Archaeological Record, Basic Field techniques in Archaeology, Methods of Dating, Role of Sciences in Archaeology, South Asian Archaeology.

Religion and Art in Early India

Evolution of religious ideas, Transition from Non-Iconic to Iconic, Evolution of Puranic religion and the major cults and their iconography, Changes in Buddhism and Jainism and their icons; Tantra, Temples.

Early Indian Social and Economic History

People in India; An Anthropological introduction; Major division between caste, society and kin-based society, Stages in the Evolution of social stratification, Towards the emergence of early historical economy and society, Theory of Indian feudalism and ruralisation of economy,The nature of caste division in Deccan and South India.

Approaches to the Study of Ancient India's Past

Its Nature, Object, Scope and Philosophy; Concept of History in the Ancient World, Ancient Indian Historical Traditions, Historical Writings, Modern Approaches to the Study of Ancient Indian Past, Role of Methodology in History, Tools and techniques with particular reference to India.

The Emergence of State in India: Magadh

Emergence of territories: Geographical and Archaeological background, Monarchies and Republics, Mahajan-padas Territorial expansion of Magadha to the time of Asoka,Structure of the Empire: The problem of political organization, Ideology of Empire,Disintegration of the empire.

Political Ideas and Institutions (From the Middle of 2nd millennium BCE to 1300 CE)

Recent trends in study of Early Indian States, Communities and Community organizations,Origin of State and its evolution since Vedic Times, Emergence of State and Saptanga Theory, Origin and Evolution of Kingship, Categories of States, GanaSamgha in Post, The Idea of Mauryan State.

The Gupta Period in Indian History

Gupta Empire, The political scenario of north India at the emergence of Gupta rule, The Gupta kings and their political policies Weakening of the kingdom its disintegration and fall, Political structure of the Gupta state and its administrative machinery Major social and cultural institutions of the times: Art and Culture, The Vakatakas, Maitrakas, Maukharis- kingdom, rulers and political relations with contemporaries, Gupta Empire, Chola Polity, Evolution of the Hypothesis of Indian Feudalism.

Deccan and South India from 300 BCE and 700 CE

The transitions from Megalithic to historic phase, Tamil Heroic Poems and the Chiefdoms From Chieftain towards Kingdom, State formation in Deccan- Satavahanas and their contemporaries Successors of

Satavahanas- Western Kshatrapas, Ikshvakus, The society and economy of Deccan and South India with focus on the maritime activities, Evolution of State in South India- the agrarian scenario, land grants, The Brahmanisation of society in South India- religions, art and literary transitions.

South India from 700 CE to 1300 CE

Survey of the Sources, Outline of the Political History of South India from 550-850 A.D., Political condition of South India in the second half of the 9th century A.D., Structure of state and society in south India: The Chola state.

History of Eastern India including the Brahmaputra valley (700 CE to 1300 CE)

Geography, Political Developments of Eastern India: a) Bihar and Bengal b) Odisha c) Brahmaputra Valley, Archaeology of Eastern India: 700 CE-1300CE.

Approaches to Archaeological Studies in India

Idea of the Orient, Role of Asiatic Society in pursuing the past,The Orientalist Constructions, The Early Surveys, Establishment of the Archaeological Survey of India in 1861, Growth of Regional Identities and Local institutions.

Archaeology: Theories and Techniques

What is theory in Archaeology? What is the relationship between theory and method? Theory and Philosophy of science, Early Development of theories since Age of Antiquarianism, Early Development of theories since Age of Antiquarianism Early 20th century approaches, New Archaeology and Processual approaches, Post Processual Critique, Development of archaeological field, Concept of sites in archaeology, Techniques of Exploration, Merits and demerits of sampling in archaeological surveys, Techniques of Excavation, Stratigraphy and Section drawing, Recording artefacts and features.

Prehistory of South Asia

Prehistory: Introduction Aims and Scope Beginning and main stages of development Principle approaches, The Quaternary Period Introduction to the Quaternary Subdivisions-Significance of the Pleistocene and Holocene periods Methods for reconstructing paleo-environment Global climate history during the Quaternary environments in India, Human Evolution and its Ramifications Definition and Theories in Primate Evolution Hominoid and Hominid Evolution in Africa Evolution out of Africa The problem of Human evolution in global and Indian contexts, South Asian Stone Age Sequence The Lower Palaeolithic –Acheulian Culture- Tools, Typology and contexts and adaptations The Middle Palaeolithic- Tools, Typology and contexts and adaptations The Upper Palaeolithic- Tools, Typology and contexts and adaptations The Mesolithic- Tools, Typology and contexts and adaptations The Neolithic –Cultural Adaptations in India, Prehistoric Rock Art: Character and Chronology.

Protohistory of South Asia

History of Proto-historical research in India- Changing trends and problems, Pre-Harappan Culture of India and Borderlands, The Mature-Harappan Culture- Origin, Political forms, Settlement and Subsistence patterns, Trade, Social and Economic life The Theory of Harappan “Decline” First urbanisation, The nature of the Late Harappan Cultures of Sind, Punjab, Haryana, U.P, Gujarat, The Chalcolithic cultures of Central and Western India The Chalcolithic cultures of Eastern India Early Food producing cultures in the Ganges valley The Iron Age problem- BRW Cultures, Megalithic cultures of the South.

Historical Archaeology of South Asia (Iron Age to Medieval)

Concept and Development of Historical Archaeology: Debates on ‘Early Historic’ and ‘Early Medieval’ in Indian Archaeology Significance of Archaeological Record- Interface between Archaeological Record and Literature, Evolution of Archaeological Cultures: OCP and Painted Grey Ware Culture in India: Chronology, Distribution and Characteristics; Major excavated sites. Early Iron Age Cultures in India: Archaeological and literary sources on beginning of iron— history of research—theories of origin of iron in India, Regional archaeological cultures of the Indian subcontinent(6th c. BCE to 12th c. CE): North-western India, Western India, Central India and Deccan, South India, Eastern, North-eastern India, The Northern Black Polished Ware (NBPW: chronology, distribution, characteristics, allied numismatic and settlement evidences) Archaeological evidence of Urbanism in early historic and early medieval India:

history of research and debates—major excavated sites—evidence of settlement pattern and distribution; Major excavated sites in eastern India: Bengal, Bihar, Odisha, Archaeology of Buddhism: major sites related to early Buddhism—major monastic sites— monastic Buddhism in early medieval Eastern India and Deccan.

Ethnoarchaeology: Theories and Practices

Ethnoarchaeology, the importance of ethnoarchaeology in archaeological research, Nature and interrelationship of archaeological and ethnographic records, Principles of analogy in ethnoarchaeological research,Ethnoarchaeology and the reconstruction of past material culture, Ethnoarchaeological Practice in South Asia- “Living Traditions”, Ethnoarchaeological Studies Outside India, Emerging concepts in Ethnoarchaeology.

Indian Epigraphy and Palaeography

Ashokan Edicts, Study of Inscriptions of Historical and Cultural Importance, Study of seals-sealings and their importance in Ancient Indian History, Origin of writing and Script in Indian Context, The Brahmi Script and its derivatives, Regional variations, The Kharosthi Script-an overview, Transcription of early Brahmi from Roman Script, Typological Survey of Inscriptions (300 CE-1200 CE), Reading Inscriptions: Prasastis, Reading Inscriptions: Land Grants.

Indian Numismatics

Origin and antiquity of Coins in India, Methods of Coin making in Ancient India,the making of Coin, Study of Ancient Indian Coinage, Tribal Coins, Local Coins, Coins of City States, Coins of the Satavahanas, Coins of the Western Kshatrapas and Kardamaka Rulers, Coins of the Gupta Kings, Principal Early Medieval Coin, Coins of the Chalukyas of Badami, Kadambas, Cholas and Pandyas, Currency Systems in South India.

Social History of India up to 400 CE

Society: Perception and Idea, Sources for the Study of Social History- Literary, Archaeological, indigenous and Foreign, Concept of Varna and Jati- problem of Untouchability- Slavery system, Asrama- Concept, situation and Variation in Point of Time,Position of Women; Occupations and Education at Theoretical and Operational Levels. Labour in Ancient India, Samskaras, second urbanisation and urban life, Guilds early maritime trade up to 400 CE.

Gender Studies: Women in Ancient India

Introduction, Women in early India, Women during the Maurya and Post, Socio Cultural and Economic Status of Women in ancient India.

Social History of India from 400 CE to 1300 CE

Sources for the Study of Social History–An Overview of Early Medieval society and recent study on social aspects, Concept of Varna-Jati from interdisciplinary perspectives, Rise of the New Professional Castes-Kayasthas and Rajput, Inter-Action between socio economic classes in Early Medieval Period, Educational System and Institutions: Brahmanical and Buddhist.

Economic History of India up to 400 CE

Source Materials for the study of Economic History,Economic condition of India from 600 BCE to 400 BCE, Mauryan Economy, Agriculture, Process of cultivation, Crops, Irrigation and states interest, UNIT IV Trade and Commerce- Inland and Foreign, Industry and Trade Organizations- Revenue System.

Economic History of India from 400 CE to 1300 CE

The Economic History of India up to 1300 CE: Trends and Perspectives, Ownership of land- System of Land grants and Agrarian Expansion in Guptas and Post- Gupta period, Agriculture and Craft Production, Trade and Market Centres in Gupta Period, Indian Feudalism.

Themes in Early Indian Social and Economic History

Society: Perception and Idea, Varna-Jati, Samskaras, Labour in Ancient India, Urbanization and Urban Life, Guilds,Maritime Trade.

Vedic Religion and its Legacy

An Introduction to Indian Religious History Early forms of Religion; Nature worship, Polytheism, Indus Religion, Rigvedic concept of Gods.

Evolution of Puranic and Hindu Religious Cults, Rituals and Ideas

An approach to the study of later Vedic religion, Later Vedic gods and rituals, Upanishad, Saivism, Syncretic cults, Vaishnavism, Cult of Jagannatha Later sects of Vaishnavism; Gopala and Radha Madhava.

Buddhism

Religious and Cultural scenario at the time of the Mauryas, Sungas and Kushanas, Spread of Buddhism in and outside India, Later phase of Buddhism: Vajrayana and Tantrayana.

Jainism

Origin and antiquity of Jainism Historicity of the Twenty four Tirthankaras Historical background of the emergence of Jainism, Life and teaching of Parsvanatha and Mahavira JainaSamgha: Hierarchy, Functions, Schism, Major sub-sects Monastic organization Distribution and spread of Jainism in Eastern India.

Tantrism

Origin of Tantrism: Pre Vedic and Vedic, Development of Tantrism, Tantrism in Mahayana Buddhism, Survival of Tantrism, Material Milieu and representation of Tantric Tradition in religious imagery.

Architecture

Proto Historic Phase: Stambhas, Stupa and Rock-cut Architecture: Ideas on Space, Built forms and Terminology, Indus valley- town planning and structures, Religious Architecture a) Origin and development of Stupas from earliest times to 700 CE- Central India, KrishnaGodavari delta region and North Western India b) Early Rock-cut caves: Evolution of Chaityagrihas and Viharas- Ajivikas (Barabar Hills); Theravada and Mahayana sects c) Jaina caves with special reference to Udayagiri and Khandagiri (Odisha) d) Brahmanical caves: Representative caves at Udaygiri (Madhya Pradesh), Aihole, Badami, Mahabalipuram, Elephanta and Ellora,

Temple Architecture (North India): Introduction- Origin of temple building in India- Early examples of religious architecture, Indian Vastuvidya and canonical styles- classifications and interpretations, Gupta temples- their types and characteristics, potentialities for future development, Nagara- Definitions, features, variations and key regions a) Eastern India- Odisha (Bhubanesvar, Puri, Konark) b) Central India- Khajuraho c) Western India- Gop, Modhera etc. d) Himalayan region- Kashmir valley and Himachal.

Temple Architecture (South India): Origin of temple building in South India- canonical texts, Dravida- definitions, features, variations and key centers a) Beginnings- Badami, Aihole, Mahakuta, Pattadakkallu b) Formation and crystallization of Dravida style- Mahabalipuram, Kanchipuam c) Expansion of Dravida style- Tanjavur, Gangaikonda, cholapuram, Darasuram etc., Variations on the west coast- Chera temples Deccan variations- the Andhra-Karnata style- later Chalukyas and Hoysalas, The culmination- Vijayanagara.

Sculpture and Painting

Definition- scope of using different media Indus art, Mauryan art, Art of the Sunga period (Sanchi, Barhut and Bodhgaya) Art of Saka-Kushana period (Mathura and Gandhara) Vengi School of art, Gupta art (Mathura and Saranath) and Central India Post-Gupta art (Pallava, Rashtrakuta and Pala, Senas, Cholas and Hoysalas), Mural paintings with special reference to Ajanta, Bagh and Chola Murals Manuscript Paintings (Eastern and Western India of Early Medieval period).

Iconography

Jain and Buddhist Iconography: Sources Origin and development of image worship Fundamentals of iconography, Buddha and Bodhisattva, Adi Buddha and Pancajinas, Female deities in Buddhism: Prajnaparamita, Tara etc., Tirthankaras, Yaksha, Yakshini and Sasanadevatas Miscellaneous images: Srutadevis, Vidyadevis, Dikpalas etc.

Brahmanical Iconography: Origin and development of image worship in early India, Brahmanical Iconography: key concepts and terminologies of iconography Major Brahmanical deities and their iconography- Vishnu, Siva, Devi, Surya and Ganapati, Vyantaradevatas- Yakshas, Nagas, Kinnaras etc. Other iconographic types including grahas and Dikpalas.

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.

GROUP-09

Mechanical Engineering Jobs (Level- Matric+ Dip in Mech. Engineering)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc.- (**Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**. -**
(Weightage 10%)

3) Subject related syllabus- (Weightage 70%)

A) STRENGTH OF MATERIALS

1. Stresses and Strains 2. Resilience 3 Moment of Inertia 4. Bending Moment and Shearing Force

5. Bending stresses 6 Columns7 Torsion 8. Springs

B) THERMODYNAMICS

1. Fundamental Concepts 2. Laws of Perfect Gases 3. Thermodynamic Processes on Gases

4. Laws of Thermodynamics 5. Ideal and Real Gases6. Properties of Steam 7. Steam Generators

8. Air Compressors 9. Introduction to Heat Transfer

C) BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

1. Application and Advantage of Electricity 2. Basic Electrical Quantities 3. Electromagnetic Induction

4. Transmission and Distribution System 5. Domestic Installation 6. Electric Motors and Pumps

7. Electrical Safety 8. Basic Electronics

D) WORKSHOP TECHNOLOGY

1. Welding 2. Pattern Making 3. Moulding and Casting4. Metal Forming Processes 5. Plastic processing 6. Cutting Tools and Cutting Materials7. Lathe 8. Drilling 9. Boring10. Shaping, Planning and Slotting 11. Broaching 12. Jigs and Fixtures 13. Cutting Fluids and Lubricants

E) MATERIALS AND METALLURGY

1. Introduction 2. Crystallography 3. Metals and Alloys 4. Theory of Heat Treatment 5. Engineering Plastics 6. Advanced Materials 7. Miscellaneous Materials

F) HYDRAULICS AND HYDRAULIC MACHINES

1. Introduction 2. Pressure and its Measurement 3. Flow of Fluids 4. Flow through Pipes 5. Flow through Orifices6. Hydraulic Machines 7. Water Turbines and Pumps

G) I.C. ENGINES

1. IC Engines 2. Fuel Supply in Petrol Engine 3. Fuel System of Diesel Engine4. Ignition System of IC Engines5. Cooling and Lubrication 6. Testing of IC Engines

H) MACHINE DESIGN AND DRAWING

1. Introduction 2. Design Failure3. Design of Shaft 4. Design of Key 5. Design of Screwed Joints

6. Cams 7. Gears

I)THEORY OF MACHINES

1. Simple Mechanisms2. Power Transmission 3. Flywheel 4. Governor 5. Balancing 6. Vibrations

J) REFRIGERATION AND AIR CONDITIONING

REFRIGERATION

1. Fundamentals of Refrigeration2. Vapour Compression System3. Refrigerants 4. Vapour Absorption System. 5. Refrigeration Equipment 5.1 Compressor - Function, various types of compressors 5.2

Condenser - Function, various types of condensers 5.3 Evaporator - Function, types of evaporators 5.4 Expansion Valve - Function, various types such as capillary tube, thermostatic expansion valve, low side and high side float valves, application of various expansion valves 5.5. Safety Devices- Thermostat, overload protector LP, HP cut out switch.

AIR CONDITIONING

6. Psychrometry Definition, importance, specific humidity, relative humidity, degree of saturation, DBT, WBT, DPT, sensible heat, latent heat, Total enthalpy of air. Psychrometry chart and various processes of psychrometry 7. Air-Conditioner Study of window air-conditioning, split type air conditioning, concept of central air- condition, automobile air-conditioning

K) ENVIRONMENTAL EDUCATION

1. Definition, Scope and Importance of Environmental Education 2. Basics of ecology, biodiversity, eco system and sustainable development 3. Sources of pollution - natural and manmade, causes, effects and control measures of pollution (air, water, noise, soil, radioactive and nuclear) and their units of measurement 4. Solid waste management – Causes, effects and control measures of urban and industrial waste 5. Mining and deforestation – Causes, effects and control measures 6. Environmental Legislation - Water (prevention and control of pollution) Act 1974, Air (Prevention and Control of Pollution) Act 1981 and Environmental Protection Act 1986, Role and Function of State Pollution Control Board, Environmental Impact Assessment (EIA) 7. Role of Non-conventional Energy Resources (Solar Energy, Wind Energy, Bio Energy, Hydro Energy) 8. Current Issues in Environmental Pollution – Global Warming, Green House Effect, Depletion of Ozone Layer, Recycling of Material, Environmental Ethics, Rain Water Harvesting, Maintenance of Groundwater, Acid Rain, Carbon Credits.

L) CNC MACHINES AND AUTOMATION

1. Introduction

Introduction to NC, CNC & DNC, their advantages, disadvantages and applications. Basic components of CNC machines, Machine Control Unit, input devices, selection of components to be machined on CNC machines, Axis identification

2. Construction and Tooling 3. System Devices 4. Part Programming 5. Problems in CNC Machines 6.Automation and NC system Robot Technology 7. Introduction to robot technology, basic robot motion and its applications

M)AUTOMOBILE ENGINEERING

1. Introduction 2. Power System 3. Transmission System4. Steering System 5. Braking system

6. Suspension System7. Auto Electrical System:

N) INSPECTION AND QUALITY CONTROL

1. Inspection 2. Measurement and Gauging 3. Statistical Quality Control4. Modern Quality Concepts

5. Instrumentation Measurement of mechanical quantities

O) INDUSTRIAL ENGINEERING

1. Productivity 2. Work Study 3. Method Study 4. Motion Analysis 5. Work Measurement 6. Wages and Incentive Schemes 7. Production Planning and Control 8. Estimating and Costing

P) ENTREPRENEURSHIP DEVELOPMENT AND MANAGEMENT

SECTION – A ENTREPRENEURSHIP

1. Introduction 2. Market Survey and Opportunity Identification 3. Project report Preparation

SECTION –B MANAGEMENT

4.Introduction to Management 5. Leadership and Motivation 6. Management Scope in Different Areas 7. Miscellaneous Topics

a) Customer Relation Management (CRM) • Definition and need • Types of CRM b) Total Quality Management (TQM) • Statistical process control • Total employees Involvement • Just in time (JIT) c) Intellectual Property Right (IPR) • Introductions, definition and its importance • Infringement related to patents, copy right, trade mark

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.

GROUP-10

Draughtsman Civil Jobs (Level- Matric+ Diploma in Draughtsman)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc.- **(Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**. -**

(Weightage 10%)

3) Subject related syllabus- **(Weightage 70%)**

ENGINEER DRAWING: Drawing instruments, lettering, lines and conventional signs of materials, dimensioning sketching, geometrical drawing, scales, Projection- Isometric projection, oblique projection, perspective views.

BUILDING MATERIAL: Bricks, Stone, Lime, Cement, Timber, Sand, Surkhi and Cinder.

BUILDING CONSTRUCTION: Brick masonry and various types of bonds, stone masonry, foundation, floor, lintels, and arches, carpentry and various types of joints, door, windows and ventilation, roofs, stairs, residential building and its planning, damp proofing course, pointing, white and colour washing, Drawing tracing, printing.

ALLIED TRADE: Electrical wiring, Carpentry, Plumbing.

SURVEYING: Chain surveying, Plane Table Surveying, Leveling and various surveying instruments.

RAIL WAY ROAD AND BRIDGE: Roads, railway culverts and bridge-classification and components.

WATER RESOURCES ENGINEERING: Hydrology, water distribution works, cross drainage works, diversion storage Head Works.

WATER SUPPLY AND SANITATION ENGINEERING: Water supply and Distribution, sanitation system, sanitary fittings, Drain and sewers.

REINFORCED CEMENT CONCRETE AND STEEL STRUCTURES: Reinforcement cement concrete- selection of material, form work extra beams and girders, rivets and type of joints, nuts and bolts, steel structures section.

ESTIMATING AND COSTING: Units of measurement, main items of building, types of estimate, method of detailed building estimate, rate analysis, building specifications.

11. BASIC COMPUTER APPLICATIONS AND AUTOCAD

Autocad (2D and 3D)-Interface, drawing commands, drafting settings, editing commands, inquiry tools, layer and objects properties, creating and editing text, annotation scale, dimensioning, hatch objects, block and symbol library, plot and drawing, managing project extra.

Water CAD-building models, scenario management, calibrating; models, using models for solving design and operation problems, sizing tanks and selecting pumps, optimal design.

ARC Info-GIS map basics, feature-attribute relationship and its benefit, creating a map layout, coordinates to find places, measurements on maps, managing map layers, symbolizing categorical data and quantitative data, styles, labels, annotation, map templates, join and related tables.

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.