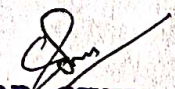


SUBJECT-EST-1	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	3 RD SEM	FACULTY NAME – DIPTI BIBHAR
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Introduction	1	
1.1	Types of estimates – Plinth area, floor area / carpet area	2	
1.2	Units and modes of measurements as per IS 1200	2	
1.3	Accuracy of measurement for different item of work	3	
2	Quantity Estimate of Building	2	
2.1	Short wall long wall method and centre line method,	2	
	deductions in masonry, plastering, white washing, painting etc	3	
	multiplying factor (paint coefficients) for painting of doors and windows (paneled/glazed), grills etc.	3	
2.2	Detailed estimate of single storied flat roof building with shallow foundation and RCC roof slab with leak proof treatment over it including staircase and mummy room	10	
3	Analysis of Rates and Valuation	1	
3.1	Analysis of rates for cement concrete	2	
	brick masonry in Cement Mortar, laterite stone masonry in Cement Mortar	2	
	cement plaster, white washing, Artificial Stone flooring, Tile flooring, concrete flooring,	3	
	R.C.C. with centering and shuttering,	2	
	reinforcing steel, Painting of doors and windows etc. as per OPWD	3	
3.2	Calculation of lead, lift, conveyance charges, royalty of materials, etc. as per Orissa P.W.D. system (Concept of C.P.W.D./Railways provisions)	5	
3.3	Abstract of cost of estimate	2	
3.4	Valuation- Value and cost, scrap value, salvage value,	2	
	assessed value, sinking fund, depreciation and obsolesce, methods of valuation	3	
4	Administrative Set-Up of Engineering Organisations:	2	
4.1	Administrative set-up and hierarchy of Engineering department in State Govt./Central Govt./PSUs/Private Sectors etc.	3	
	Duties and responsibilities of Engineers at different positions /levels.	3	




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FILE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Review Of Basic Concepts	1	
1.1	Basic Principle of Mechanics: Force, Moment, support conditions, Conditions of equilibrium, C.G & MI, Free body diagram	3	
1.2	Review of CG and MI of different sections	1	
2	Simple And Complex Stress, Strain	1	
2.1	Simple Stresses and Strains Introduction to stresses and strains: Mechanical properties of materials – Rigidity, Elasticity, Plasticity, Compressibility, Hardness, Toughness, Stiffness, Brittleness, Ductility, Malleability, Creep, Fatigue, Tenacity, Durability, Types of stresses -Tensile, Compressive and Shear stresses, Types of strains - Tensile, Compressive and Shear strains, Complimentary shear stress - Diagonal tensile / compressive Stresses due to shear, Elongation and Contraction, Longitudinal and Lateral strains, Poisson's Ratio, Volumetric strain, computation of stress, strain, Poisson's ratio, change in dimensions and volume etc, Hooke's law - Elastic Constants, Derivation of relationship between the elastic constants.	15	
2.2	Application of simple stress and strain in engineering field: Behaviour of ductile and brittle materials under direct loads, Stress Strain curve of a ductile material, Limit of proportionality, Elastic limit, Yield stress, Ultimate stress, Breaking stress, Percentage elongation, Percentage reduction in area, Significance of percentage elongation and reduction in area of cross section, Deformation of prismatic bars due to uniaxial load, Deformation of prismatic bars due to its self weight.	8	
2.3	Principal stresses and strains: Occurrence of normal and tangential stresses, Concept of Principal stress and Principal Planes, major and minor principal stresses and their orientations, Mohr's Circle and its application to solve problems of complex stresses	4	
3	Stresses In Beams and Shafts	1	
3.1	Stresses in beams due to bending: Bending stress in beams – Theory of simple bending – Assumptions – Moment of resistance – Equation for Flexure– Flexural stress distribution – Curvature of beam – Position of N.A. and Centroidal Axis – Flexural rigidity – Significance of Section modulus	4	
3.2	Shear stresses in beams: Shear stress distribution in beams of rectangular, circular and standard sections symmetrical about vertical axis.	2	
3.3	Stresses in shafts due to torsion: Concept of torsion, basic assumptions of pure torsion, torsion of solid and hollow circular sections, polar moment of inertia, torsional shearing stresses, angle of twist, torsional rigidity, equation of torsion	6	
3.4	Combined bending and direct stresses: Combination of stresses, Combined direct and bending stresses, Maximum and Minimum stresses in Sections, Conditions for no tension, Limit of eccentricity, Middle third/fourth rule, Core or Kern for square, rectangular and circular sections, chimneys, dams and retaining walls	5	
4	Columns and Struts	1	
4.1	Columns and Struts, Definition, Short and Long columns, End conditions, Equivalent length / Effective length, Slenderness ratio, Axially loaded short and long column, Euler's theory of long columns, Critical load for Columns with different end conditions	3	
5	Shear Force and Bending Moment	1	
5.2	Types of loads and beams: Types of Loads: Concentrated (or) Point load, Uniformly Distributed load (UDL), Types of Supports: Simple support, Roller support, Hinged support, Fixed support, Types of Reactions: Vertical reaction, Horizontal reaction, Moment reaction, Types of Beams based on support conditions: Calculation of support reactions using equations of static equilibrium.	8	
5.3	Shear force and bending moment in beams: Shear Force and Bending Moment: Signs Convention for S.F. and B.M, S.F and B.M of general cases of determinate beams with concentrated loads and udl only, S.F and B.M diagrams for Cantilevers, Simply supported beams and Over hanging beams, Position of maximum BM, Point of contra flexure, Relation between intensity of load, S.F and B.M.	10	
6	Slope and Deflection	1	
6.1	Introduction: Shape and nature of elastic curve (deflection curve); Relationship between slope, deflection and curvature (No derivation), Importance of slope and deflection.	2	
6.2	Slope and deflection of cantilever and simply supported beams under concentrated and uniformly distributed load (by Double Integration method, Macaulay's method).	2	
7	Indeterminate Beams	1	
7.1	Indeterminacy in beams, Principle of consistent deformation/compatibility, Analysis of propped cantilever, fixed and two span continuous beams by principle of superposition, SF and BM diagrams (point load and udl covering full span)	3	
8	Trusses	1	
8.1	Introduction: Types of trusses, statically determinate and indeterminate trusses, degree of indeterminacy, stable and unstable trusses, advantages of trusses	2	
8.2	Analysis of trusses: Analytical method (Method of Joints, method of Section)	2	


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Sl. No	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH TOPICS TO BE COVERED	3 RD SEM NO OF PERIODS REQUIRED	FACULTY NAME- V.PAWNI TENTATIVE DATE FOR COMPLETION
1	The Multidisciplinary nature of environmental studies	1	
1.1	Definition, scope and importance, Need for public awareness.	1	
2	Natural Resources	1	
	Renewable and non renewable resources:		
	Natural resources and associated problems.	4	
	Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction mining, dams and their effects on forests and tribal people.		
	Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems	3	
2.1	Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.	1	
2.2	Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity.	4	
2.3	Energy Resources: Growing energy need, renewable and nonrenewable energy sources, use of alternate energy sources, case studies.	2	
2.4	Land Resources: Land as a resource, land degradation, man induces landslides, soil erosion, and desertification b) Role of individual in conservation of natural resources. c) Equitable use of resources for sustainable life styles.	5	
3	Systems	1	
3.1	Concept of an eco system. Structure and function of an eco system. • Producers, consumers ,decomposers. • Energy flow in the eco systems. • Ecological succession. • Food chains, food webs and ecological pyramids.	4	
3.2	Introduction, types, characteristic features, structure and function of the following eco system: • Aquatic eco systems (ponds, streams, lakes ,rivers, oceans, estuaries).	3	
4	Biodiversity and it's Conservation-Introduction-Definition: genetics, species and ecosystem diversity. Biogeographically classification of India.	1	
4.1	Value of biodiversity: consumptive use, productive use, social • ethical, aesthetic and optinvalues	1	
4.2	Biodiversity at global, national and local level. Threats to biodiversity: Habitats loss, poaching of wild life, man • wildlife conflicts.	1	
5	Environmental Pollution-Definition Causes, effects and control measures of:	1	
5.1	a) Air pollution. b) Water pollution. c) Soil pollution d) Marine pollution e) Noise pollution. f) Thermal pollution g) Nuclear hazards	2	
5.2	Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Disaster management: Floods, earth quake, cyclone and landslides.	3	
6	Social Issues and the Environment-Form unsustainable to sustainable development. Urban problems related to energy. • Water conservation, rain water harvesting, water shed management.	4	
6.1	Resettlement and rehabilitation of people; Its problems and concern. Environmental ethics: Issue and possible solutions. • Climate change, global warming ,acid rain , ozone layer depletion , nuclear accidents and holocaust, case studies.	5	
6.2	Air (prevention and control of pollution) Act. Water (prevention and control of pollution) Act. • Public awareness.	2	
7	Human population and the environment	2	
7.1	Population growth and variation among nations. Population explosion- family welfare program.	4	
7.2	Human rights. Value education	1	
7.3	Role of information technology in environment and human health.	3	

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	TOPICS TO BE COVERED		NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Introduction		1	
1.1	Soil and Soil Engineering		1	
1.2	Scope of Soil Mechanics		1	
1.3	Origin and formatlon of soil		1	
2	Preliminary Definitions and Relationship		1	
2.1	Soil as a three Phase system		1	
2.2	Water Content, Density, Specific gravity, Voids ratio, Porosity, Percentage of air voids, air content, degree of saturation, density Index, Bulk/Saturated/dry/submerged density, Interrelationship of various soil parameters		10	
3	Index Properties of Soil		1	
3.1	Water Content		1	
3.2	Specific Gravity		1	
3.3	Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses		2	
3.4	Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index		3	
4	Classification of Soil		1	
4.1	General		1	
4.2	I.S. Classification, Plasticity chart		1	
5	Permeability and Seepage		1	
5.1	Concept of Permeability, Darcy's Law, Co-efficient of Permeability,		1	
5.2	Factors affecting Permeability		1	
5.3	Constant head permeability and falling head permeability Test		1	
5.4	Seepage pressure, effective stress, phenomenon of quick sand		1	
6	Compaction and Consolidation		1	
6.1	Compaction: Compaction, Light and heavy compaction Test, Optimum Moisture ¹ Content of Soil, Maximum dry density, Zero air void line, Factors affecting Compaction, Field compaction methods and their suitability		5	
6.2	Consolidation: Consolidation, distinction between compaction and consolidation. Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications		3	
7	Shear Strength		1	
7.1	Concept of shear strength, Mohr- Coulomb failure theory, Cohesion, Angle of internal friction, strength envelope for different type of soil, Measurement of shear strength;- Direct shear test, triaxial shear test, unconfined compression test and vane-shear test		5	
8	Earth Pressure on Retaining Structures		1	
8.1	Active earth pressure, Passive earth pressure, Earth pressure at rest.		1	
8.2	Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge, (ii) backfill with uniform surcharge		2	
9	Foundation Engineering		1	
9.1	Functions of foundations, shallow and deep foundation, different type of shallow and deep foundations with sketches. Types of failure (General shear, Local shear & punching shear)		5	
9.2	Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae & IS Code formulae for strip, Circular and square footings, Effect water table on bearing capacity of soil		2	
9.3	Plate load test and standard penetration test		1	

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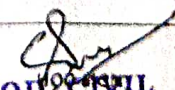
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Sl. No.	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	3 RD SEM	FACULTY NAME – SIBANI JENA
Sl. No.	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
PART :A (BUILDING MATERIALS)			
1	Stone	1	
1.1	Classification of rock, uses of stone, natural bed of stone,	2	
1.2	Qualities of good building stone,	1	
1.3	Dressing of stone	1	
1.4	Characteristics of different types of stone and their uses	1	
2	Bricks	1	
2.1	Brick earth – Its composition	1	
2.2	Brick making – Preparation of brick earth, Moulding, Drying, Burning in kilns (continuous Process)	2	
2.3	Classification of bricks, size of traditional and modular bricks, qualities of good building bricks	2	
3	Cement, Mortar and Concrete	1	
3.1	Cement: Types of cements, Properties of cements, Manufacturing of cement	2	
3.2	Importance and application of blended cement with fly ash and blast furnace slag.	2	
3.3	Mortar: Definition and types of mortar	1	
3.4	Sources and classification of sand, Bulking of sand	1	
3.5	Use of gravel, morrum and fly ash as different building materia	2	
3.6	Concrete: Definition and composition- Water cement ratio- Workability, mechanical properties and grading of aggregates, mixing, placing, compacting and curing of concrete	2	
4	Other Construction Materials	1	
4.1	Timber: Classification and Structure of timber	1	
4.2	Seasoning of timber – Importance.	1	
4.3	Characteristics of good timber	1	
4.4	Clay products and refractory materials – Definition and Classification.	1	
4.5	Properties and uses of refractory materials- tiles, terracotta, porcelain glazing	1	
4.6	Iron and Steel: Uses of cast iron, wrought iron, mild steel and tor stee	1	
5	Surface Protective Materials	1	
5.1	Composition of Paints, enamels, varnishes	1	
5.2	Types and uses of surface protective materials like Paints, Enamels, Varnishes, Distempers, Emulsion, French polish and Wax Polish	2	
PART: B (CONSTRUCTIONS TECHNOLOGY)			
1	Introduction	1	
1.1	Buildings and classification of buildings based on occupancy	1	
1.2	Different components of a building.	1	
1.3	Site investigation – objectives, site reconnaissance and explorations	1	
2	Foundations	1	
2.1	Concept of foundation and Its purpose	1	
2.2	Types of foundations – shallow and deep	1	
2.3	Shallow foundation-constructural details of : Spread foundations for walls, thumb rules for depth and width of foundation and thickness of concrete block	1	
2.4	Deep foundations: Pile foundations-their suitability, classification of piles based on materials, function and method of installation.	1	
3	Walls & Masonry Works	1	
3.1	Purpose of walls	1	
3.2	Classification of walls – load bearing, non-load bearing walls, retaining walls.	1	
3.3	Classification of walls as per materials of construction: brick, stone, reinforced brick, reinforced concrete, precast, hollow and solid concrete block and composite masonry walls (Concept Only).	1	
3.4	Partition Walls : Suitability and uses of brick and wooden partition walls	1	
3.5	Brick masonry : Definition of different terms	1	
3.6	Bond – meaning and necessity: English bond for 1and 1-1/2 Brick thick walls. T, X and right angled corner junctions. Thickness for 1and 1-1/2 brick square pillars in English bond	1	
3.7	Stone Masonry :	1	
3.8	Glossary of terms –String course, corbel, cornice, block-in-course, grouting, mouldings, templates, throating, through stones, parapet, coping, pilaster and buttress	1	
4	Doors, Windows And Lintels	1	
4.1	Glossary of terms used In doors and windows	1	
4.2	Doors – different types of doors	1	

	Windows – different types of windows	1	
4.4	Purpose of use of arches and lintels	1	
5	Floors, Roofs and Stairs	1	
5.1	Floors: Glossary of terms ,Types of floor finishes – cast-in-situ, concrete flooring(monolithic, bonded), terrazzo tile flooring, cast in situ Terrazzo flooring, timber flooring (Concept only)	1	
5.2	Roofs: Glossary of terms, Types of roofs, concept and function of flat, pitched, hipped and Sloped roofs	1	
5.3	Stairs: Glossary of terms; Stair case, winder, landing, stringer, newel, baluster, rise, tread, width of stair case, hand rail, nosing, head room, mumty room	1	
5.4	Various types of stair case – straight flight, dog legged, open well, quarter turn, half turn (newel and geometrical stairs), bifurcated stair, spiral stair, cantilever stair, tread riser stair.	1	
6	Protective, Decorative Finishes, Damp and Termite Proofing	1	
6.1	Plastering – purpose – Types of plastering, Types of plaster finishes – Grit finish, rough cast, smooth cast, sand faced, pebble dash, acoustic plastering and plain plaster etc.	1	
6.2	Proportion of mortars used for different plasters, preparation of mortars, techniques of plastering and curing	1	
6.3	Pointing – purpose –Types of pointing	1	
6.4	Painting – objectives – method of painting new and old wall surfaces, wood surface and metal surfaces – powder coating and spray painting on metal surfaces.	2	
6.5	White washing – Colour washing – Distemping – internal and external walls.	1	
6.6	Damp and Termite proofing – Materials and Methods.	1	
7	Green Buildings, Energy Management and Energy Audit Of Buildings & Project	1	
7.1	Concept of green building	1	
7.2	Introduction to Energy Management and Energy Audit of Buildings.	1	
7.3	Aims of energy management of buildings	1	
7.4	Types of energy audit, Response energy audit questionnaire	1	
7.5	Energy surveying and audit report.	1	


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SUBJECT- STRUCTURAL DESIGN - I	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	4 th SEM	FACULTY NAME - ATUL BANJAN
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Working stress method (WSM)		
1.1	Objectives of design and detailing. State the different methods of design of concrete structures	2	
1.2	Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete and steel. Permissible stresses, assumption in W.S.M.	2	
1.3	Flexural design and analysis of single reinforced sections from first principles	1	
1.4	Concept of under reinforced, over reinforced and balanced sections	1	
1.5	Advantages and disadvantages of WSM, reasons for its obsolescence.	1	
2	Philosophy Of Limit State Method (LSM)		
2.1	Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy	2	
2.2	Types of limit states, partial safety factors for materials strength, characteristic strength, characteristic load, design load, loading on structure as per I.S. 875	3	
2.3	Study of IS specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing, minimum reinforcement in slab, beam & column, lapping, anchorage, effective span for beam & slab	3	
3	Analysis and Design of Single and Double Reinforced Sections (LSM)		
3.1	Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel, neutral axis, stress block diagram and strain diagram for singly reinforced section.	4	
3.2	Concept of under-reinforced, over-reinforced and limiting section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section	4	
3.3	Analysis and design: determination of design constants, moment of resistance and area of steel for rectangular sections	2	
3.4	Necessity of doubly reinforced section, design of doubly reinforced rectangular section	1	
4	Shear, Bond and Development Length (LSM)		
4.1	Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress, design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement	2	
4.2	Bond and types of bond, bond stress, check for bond stress, development length in tension and compression, anchorage value for hooks 90° bend and 45° bend standards lapping of bars, check for development length	3	
4.3	Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear. Design of shear reinforcement; Minimum shear reinforcement in beams (Explain through examples only).	4	
5	Analysis and Design of T-Beam (LSM)		
5.1	General features, advantages, effective width of flange as per IS: 456-2000 code provisions.	2	
5.2	Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam section with neutral axis lying within the flange	4	
5.3	Simple numerical problems on deciding effective flange width. (Problems only on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange shall be asked in written examination)	4	
6	Analysis and Design of Slab and Stair case (LSM)		
6.1	Design of simply supported one-way slabs for flexure check for deflection control and shear	2	
6.2	Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.	2	
6.3	Design of two-way simply supported slabs for flexure with corner free to lift.	1	
6.4	Design of dog-legged staircase	1	
6.5	Detailing of reinforcement in stairs spanning longitudinally	1	
7	Design of Axially loaded columns and Footings (LSM)		
7.1	Assumptions in limit state of collapse- compression	1	
7.2	Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties	4	
7.3	Analysis and Design of axially loaded short square, rectangular and circular columns (with lateral ties only)	2	
7.4	Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.	1	


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TOPICS TO BE COVERED		NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS:		1	
Surveying: Definition, Aims and objectives		1	
Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.		2	
1.2	Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying.	2	
1.3	Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.	2	
1.4	Errors and mistakes in linear measurement – classification, Sources of errors and remedies	2	
1.5	Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections.	2	
2	CHAINING AND CHAIN SURVEYING :	1	
2.1	Equipment and accessories for chaining	1	
2.2	Ranging – Purpose, signaling, direct and Indirect ranging, Line ranger – features and use, error due to incorrect ranging	3	
2.3	Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.	2	
2.4	Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles	2	
2.5	Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines	2	
2.7	Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square.	2	
2.8	Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying.	2	
3	ANGULAR MEASUREMENT AND COMPAS SURVEYING :	1	
3.1	Measurement of angles with chain, tape & compass	1	
3.2	Compass – Types, features, parts, merits & demerits, testing & adjustment of compass	1	
3.3	Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings	2	
3.4	Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing, Numerical problems on computation of interior & exterior angles from bearings	2	
3.5	5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.	1	
3.6	Errors in angle measurement with compass – sources & remedies.	1	
3.7	Principles of traversing – open & closed traverse, Methods of traversing.	1	
3.8	Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.	1	
3.9	Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table	1	
4	MAP READING CADASTRAL MAPS & NOMENCLATURE:	1	
4.1	Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols	1	
4.2	Cadastral Map Preparation Methodology	1	
4.3	Unique identification number of parcel	1	
4.4	Positions of existing Control Points and its types	1	
4.5	Adjacent Boundaries and Features, Topology Creation and verification	1	
5	PLANE TABLE SURVEYING :	1	
5.1	Objectives, principles and use of plane table surveying.	1	
5.2	Instruments & accessories used in plane table surveying.	1	
5.3	Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.	1	
5.4	Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.	1	
6	THEODOLITE SURVEYING AND TRAVERSING:	1	
6.1	Purpose and definition of theodolite surveying	1	
6.2	Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite	2	
6.3	Concept of transiting –Measurement of horizontal and vertical angles.	2	
6.4	Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.	2	
6.5	Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method, Plotting the traverse by coordinate method, Checks for open and closed traverse	2	
6.6	Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings	3	
6.7	Closing error – adjustment of angular errors, adjustment of bearings, numerical problems	1	
6.8	Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse.	1	
7	LEVELLING AND CONTOURING	1	
7.1	Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M.	1	
7.2	Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis.	1	
7.3	Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI.	1	
7.4	Field data entry – level Book – height of collimation method and Rise & Fall method, comparison, Numerical problems on reduction of levels applying both methods, Arithmetic checks.	1	
7.5	Effects of curvature and refraction, numerical problems on application of correction.	1	
7.6	Reciprocal leveling – principles, methods, numerical problems, precise leveling	1	
7.7	Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels.	1	
7.8	Definitions, concepts and characteristics of contours	1	
7.9	Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.	1	
7.10	Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure	3	
7.11	Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.), Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.), Problem Solving and Decision Making	3	
8	COMPUTATION OF AREA & VOLUME:	1	
8.1	Determination of areas, computation of areas from plans	2	
8.2	Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.	2	
8.3	Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.	2	

SUBJECT- HIGHWAY ENGINEERING	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	4 th SEM	FACULTY NAME – HRUSHIKESH SETHI
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Introduction	1	
1.1	Importance of Highway transportation: importance organizations like Indian roads congress, Ministry of Surface Transport, Central Road Research Institute	2	
1.2	Functions of Indian Roads Congress	1	
1.3	IRC classification of roads	1	
1.4	Organisation of state highway department	1	
2	Road Geometrics	1	
2.1	Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation level, camber and gradient	5	
2.2	Design and average running speed, stopping and passing sight distance	1	
2.3	Necessity of curves, horizontal and vertical curves including transition curves and super elevation, Methods of providing super – elevation	3	
3	Road Materials	1	
3.1	Difference types of road materials in use: soil, aggregates, and binders	2	
3.2	Function of soil as highway Subgrade	1	
3.3	California Bearing Ratio: methods of finding CBR valued in the laboratory and at site and their significance	2	
3.4	Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test & soundness test	2	
4	Road Pavements	1	
4.1	Road Pavement: Flexible and rigid pavement, their merits and demerits, typical cross-sections, functions of various components Flexible pavements:	4	
4.2	Sub-grade preparation: Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profile of embankment, construction of embankment, compaction, stabilization, preparation of subgrade, methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation	5	
4.3	Sub base Course: Necessity of sub base, stabilized sub base, purpose of stabilization (no designs) Types of stabilization • Mechanical stabilization• Lime stabilization• Cement stabilization• Fly ash stabilization•	5	
4.4	Base Course: Preparation of base course, Brick soling, stone soling and metalling, Water Bound Macadam and wet-mix Macadam, Bituminous constructions: Different types	5	
4.5	Surfacing: Surface dressing• (i) Premix carpet and (ii) Semi dense carpet Bituminous concrete• Grouting•	1	
4.6	Rigid Pavements: Concept of concrete roads as per IRC specifications	1	
5	Hill Roads:	1	
5.1	Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cutting and partly in filling	2	
5.2	Breast Walls, Retaining walls, different types of bends	1	
6	Road Drainage:	1	
6.1	Necessity of road drainage work, cross drainage works	1	
6.2	Surface and sub-surface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage, intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections.	7	
7	Road Maintenance :	1	
7.1	Common types of road failures – their causes and remedies	1	
7.2	Maintenance of bituminous road such as patch work and resurfacing	1	
7.3	Maintenance of concrete roads – filling cracks, repairing joints, maintenance of shoulders (berm), maintenance of traffic control devices	3	
7.4	Basic concept of traffic study, Traffic safety and traffic control signal	1	
8	Construction equipments:	1	
8.1	Preliminary ideas of the following plant and equipment: Hot mixing plant	1	
8.2	Tipper, tractors (wheel and crawler) scraper, bulldozer, dumpers, shovels, graders, roller dragline	2	
8.3	Asphalt mixer and tar boilers	1	
8.4	Road pavers	1	
8.5	Modern construction equipments for roads	1	

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SUBJECT- HYDRAULIC & IRRIGATION ENGINEERING	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	4TH SEM	FACULTY NAME – HRUSHIKESH SETHI
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	HYDROSTATICS:		
1.1	Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses	1	
1.2	Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head; pressure gauges.	3	
1.3	Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface.	2	
2	KINEMATICS OF FLUID FLOW		
2.1	Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation	4	
2.2	Flow over Notches and Weirs: Notches, Weirs, types of notches and weirs, Discharge through different types of notches and weirs-their application (No Derivation)	4	
2.3	Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application	3	
2.4	Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines (Concept Only).	3	
2.5	Flow through the Open Channels: Types of channel sections-rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section	2	
3	PUMPS:		
3.1	Type of pumps	2	
3.2	Centrifugal pump: basic principles, operation, discharge, horse power & efficiency.	2	
3.3	Reciprocating pumps: types, operation, discharge, horse power & efficiency	3	
	PART: B (Irrigation Engineering)		
1	Hydrology		
1.1	Hydrology Cycle	2	
1.2	Rainfall: types, intensity, hyetograph	1	
1.3	Estimation of rainfall, rain gauges, Its types(concept only)	1	
1.4	Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae	2	
2	Water Requirement of Crops		
2.1	Definition of irrigation, necessity, benefits of irrigation, types of irrigation	2	

2.2	Crop season	1	
2.3	Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops	2	
2.4	Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio	3	
3	FLOW IRRIGATION		
3.1	Canal irrigation, types of canals, loss of water in canals	2	
3.2	Perennial irrigation	1	
3.3	Different components of irrigation canals and their functions	2	
3.4	Sketches of different canal cross-sections	2	
3.5	Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages	4	
4	WATER LOGGING AND DRAINAGE		
4.1	Causes and effects of water logging, detection, prevention and remedies	3	
5	DIVERSION HEAD WORKS AND REGULATORY STRUCTURES		
5.1	Necessity and objectives of diversion head works, weirs and barrages	4	
5.2	General layout, functions of different parts of barrage	2	
5.3	Silting and scouring	1	
5.4	Functions of regulatory structures	1	
6	CROSS DRAINAGE WORKS		
6.2	Functions and necessity of Cross drainage works - aqueduct, siphon, superpassage, level crossing	2	
6.3	Concept of each with help of neat sketch	1	
7	DAMS		
7.1	Necessity of storage reservoirs, types of dams	2	
7.2	Earthen dams: types, description, causes of failure and protection measures	2	
7.3	Gravity dam- types, description, Causes of failure and protection measures.	2	
7.4	Spillways- Types (With Sketch) and necessity.	1	


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SUBJECT-EST-2	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	5TH SEM	FACULTY NAME – DIPTI BIBHAR
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Detailed estimate of culverts and bridges		
1.1	Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule.	3	
1.2	RCC Hume pipe culvert with splayed angled wing wall	2	
2	Estimate of irrigation structures	3	
2.1	Detailed estimate of simple type of vertical fall to given specification	3	
2.2	Detailed estimate of drainage siphon to given specification.	2	
3	Detailed estimate of roads		
3.1	Detail estimate of a water bound macadam road	4	
3.2	Detailed estimate of a flexible pavement in cutting / filling	2	
3.3	Detailed estimate of septic tank and soak pit for 50 users	2	
4	Miscellaneous estimates	3	
4.1	Tube well, Piles and Pile cap, Isolated and combined footings	3	
5	PWD Accounts works		
5.1.1	Works Classification of work-original, major, petty, repair work, annual repair, special repair, quadrantal repair	4	
5.1.2	Concept of Method of execution of works through the contractors and department, contract and agreement, work order, types of contract, piece work agreement	4	
5.2.1	Accounts of works – Explanation of various terms Administrative approval, technical sanction, tender, preparation of notice inviting tender, quotations, earnest money, E-tendering, security deposit, advance payment, intermediate payment, final payment, running bill, final bill, regular and temporary establishment, cash, major & subhead of account, temporary advance (imprest money),supervision charges, suspense account, debit, credit, book transfer, voucher and related accounts .	3	
5.2.2	Measurement book use & maintenance, procedure of marking entries of measurement of work and supply of materials, labour employed,	4	

	standard measurement books and common irregularity		
5.2.3	Muster roll : Its preparation & use for making payment of pay & wages	2	
5.2.4	Acquittance Roll : Its preparation & use for making payment of pay & wages	2	
5.2.5	Labour & labour report, method of labour payment, use of forms and necessity of Submission	3	
5.2.6	Classification of stores, receipt / issue statement on standard form, method of preparation of stock account, preparation and submission of returns, verification of stocks, shortage and excess	6	
5.2.7	Building BYLAWS and REGULATORY Bodies, Development authorities, types and their levels, RERA etc.	4	


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SUBJECT-WS&WWE	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	5 TH SEM	FACULTY NAME – ATUL RANJAN
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Introduction to Water Supply, Quantity and Quality of water	1	
1.1	Necessity of treated water supply	1	
1.2	Per capita demand, variation in demand and factors affecting demand	2	
1.3	Methods of forecasting population, Numerical problems using different methods	2	
1.4	Impurities in water – organic and inorganic, Harmful effects of impurities	1	
1.5	Analysis of water –physical, chemical and bacteriological	2	
1.6	Water quality standards for different uses	1	
2	Sources and Conveyance of water		
2.1	Surface sources – Lake, stream, river and impounded reservoir	1	
2.2	Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well	1	
2.3	Yield from well- methods of determination, Numerical problems using yield formulae (deduction excluded)	2	
2.4	Pumps for conveyance & distribution – types, selection, installation.	2	
2.5	Pipe materials – necessity, suitability, merits & demerits of each type	1	
2.6	Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method	1	
2.7	Intakes – types, description of river intake, reservoir intake, canal intake	1	
3	Treatment of water		
3.1	Flow diagram of conventional water treatment system	1	
3.2.1	Treatment process / units : 3.2.1 Aeration ; Necessity	2	
3.2.2	Plain Sedimentation : Necessity, working principles, Sedimentation	2	
3.2.3	Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)	2	
3.2.4	Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features	2	
3.2.5	Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, superchlorination	3	
3.2.6	Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)	3	
4	Distribution system And Appurtenance in distribution system:	1	
4.1	General requirements, types of distribution system-gravity, direct and combined	2	
4.2	Methods of supply – intermittent and continuous	1	
4.3	Distribution system layout – types, comparison, suitability	1	
4.4	Valves-types, features, uses, purpose-slucice valves, check valves, air valves, scour valves, Fire hydrants, Water meters	2	

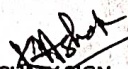
5	W/s plumbing in building :		
5.1	Method of connection from water mains to building supply	1	
5.2	General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.	2	
6	WASTE WATER ENGINEERING-		
6.1	Introduction 6.1 Aims and objectives of sanitary engineering	1	
6.2	Definition of terms related to sanitary engineering	1	
6.3	Systems of collection of wastes- Conservancy and Water Carriage System – features, comparison, suitability	2	
7	Quantity and Quality of sewage		
7.1	Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage	3	
7.2	Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring	2	
7.3	General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological	1	
7.4	Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD	1	
8	Sewerage system		
8.1	Types of system-separate, combined, partially separate , features, comparison between the types, suitability	2	
8.2	Types of system-separate, combined, partially separate , features, comparison between the types, suitability	2	
8.3	Laying of sewer-setting out sewer alignment	1	
9	Sewer appurtenances and Sewage Disposal:	1	
9.1	Manholes and Lamp holes – types, features, location, function	1	
9.2	Inlets, Grease & oil trap – features, location, function	1	
9.3	Storm regulator, inverted siphon – features, location, function	1	
9.4	Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies	1	
9.5	Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream	1	
10	Sewage treatment :		
10.1	Principles of treatment, flow diagram of conventional treatment	1	
10.2	Primary treatment – necessity, principles, essential features, functions	2	
10.3	Secondary treatment – necessity, principles, essential features, functions	1	
11	Sanitary plumbing for building :		
11.1	Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage	2	
11.2	Plumbing arrangement of single storied & multi storied building as per I.S. code practice	1	
11.3	Plumbing arrangement of single storied & multi storied building as per I.S. code practice	2	



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SUBJECT-EM MODULE NO	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH TOPICS TO BE COVERED	5 TH SEM NO OF PERIODS REQUIRED	FACULTY NAME- K ASHOK TENTATIVE DATE FOR COMPLETION
		1	
1	Entrepreneurship	2	
	Concept /Meaning of Entrepreneurship, Need of Entrepreneurship	2	
	Characteristics, Qualities and Types of entrepreneur, Functions ,Barriers In entrepreneurship	2	
	Entrepreneurs vrs. Manager1 Forms of Business Ownership: Sole proprietorship, partnership forms and others	2	
	Types of Industries, Concept of Start-ups	1	
	Entrepreneurial support agencies at National, State, District Level(Sources): DIC, NSIC,OSIC, SIDBI, NABARD, Commercial Banks, KVIC etc	3	
	Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks	1	
2	Market Survey and Opportunity Identification (Business Planning)		
	Business Planning SSI, Ancillary Units, Tiny Units, Service sector Units	1	
	Time schedule Plan, Agencies to be contacted for Project Implementation Assessment of Demand and supply and Potential areas of Growth	2	
	Identifying Business Opportunity Final Product selection	2	
3	Project report Preparation	2	
	Preliminary project report Detailed project report, Techno economic Feasibility Project Viability	3	
4	Management Principles	1	
	Definitions of management Principles of management	1	
	Functions of management (planning, organizing , staffing, directing and controlling etc.) Level of Management in an Organisation	3	
5.	Functional Areas of Management	1	
	a) Production management , Functions, Activities Productivity Quality control Production Planning and control	2	
	b) Inventory Management Need for Inventory management Models/Techniques of Inventory management	2	
	c) Financial Management Functions of Financial management Management of Working	2	
	Costing (only concept) Break even Analysis Brief idea about Accounting Terminologies: Book Keeping, Journal entry Petty Cash book, P&L Accounts, Balance Sheets(only Concepts)	2	
	d) Marketing Management Concept of Marketing and Marketing Management Marketing Techniques (only concepts) Concept of 4P s (Price, Place, Product, Promotion)	3	
	e) Human Resource Management Functions of Personnel Management Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages	3	
6	Leadership and Motivation	1	
	a) Leadership Definition and Need/Importance Qualities and functions of a leader Manager Vs Leader Style of Leadership (Autocratic, Democratic, Participative)	2	
	b) Motivation Definition and characteristics Importance of motivation Factors affecting motivation Theories of	2	

	motivation (Maslow)		
	Methods of Improving Motivation Importance of Communication In Business Types and Barriers of Communication	2	
7	Work Culture, TQM & Safety	2	
	Human relationship and Performance In Organization Relations with Peers, Superiors and Subordinates		
	TQM concepts: Quality Policy, Quality Management, Quality system Accidents and Safety, Cause, preventive measures, General Safety Rules , Personal Protection Equipment(PPE)	1	
8	Legislation	2	
	a) Intellectual Property Rights(IPR), Patents, Trademarks, Copyrights b) Features of Factories Act 1948 with Amendment (only salient points) c) Features of Payment of Wages Act 1936 (only salient points)	4	
9	Smart Technology	1	
	Concept of IOT, How IOT works Components of IOT, Characteristics of IOT, Categories of IOT	1	
	Applications of IOT- Smart Cities, Smart Transportation, Smart Home, Smart Healthcare, Smart Industry, Smart Agriculture, Smart Energy Management etc.	2	


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SUBJECT-SD-II	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	5 TH SEM	FACULTY NAME-DIPTI BIBHAR
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Introduction:		
1.1	Common steel structures, Advantages & disadvantages of steel structures	1	
1.2	Types of steel, properties of structural steel	3	
1.3	Rolled steel sections, special considerations in steel design	2	
1.4	Loads and load combinations.		
1.5	Structural analysis and design philosophy		
1.6	Brief review of Principles of Limit State design.		
2	Structural Steel Fasteners and Connections.		
2.1	Bolted Connections	4	
2.1.1	Classification of bolts, advantages and disadvantages of bolted connections.		
2.1.2	Different terminology, spacing and edge distance of bolt holes.	4	
2.1.3	Types of bolted connections.	3	
2.1.4	Types of action of fasteners, assumptions and principles of design.	3	
2.1.5	Strength of plates in a joint, strength of bearing type bolts (shear capacity & bearing capacity), reduction factors, and shear capacity of HSFG bolts.		
2.1.6	Analysis & design of Joints using bearing type and HSFG bolts (except eccentric load and prying forces)		
2.1.7	Efficiency of a joint.		
2.2	Welded Connections,		
2.2.1	Advantages and Disadvantages of welded connection		
2.2.2	Types of welded joints and specifications for welding		
2.2.3	Design stresses in welds.		
2.2.4	Strength of welded joints.	2	
3	Design of Steel tension Members		
3.1	Common shapes of tension members	2	
3.2	Maximum values of effective slenderness ratio.	2	
3.3	Analysis and Design of tension members. (Considering strength only and concept of block shear failure.)	3	
4	Design of Steel Compression members.		
4.1	Common shapes of compression members.		
4.2	Buckling class of cross sections, slenderness ratio	2	
4.3	4.3 Design compressive stress and strength of compression members.	1	
4.4	Analysis and Design of compression members (axial load only).	1	
5	Design of Steel beams:	2	
5.1	Common cross sections and their classification.		
5.2	Deflection limits, web buckling and web crippling	2	
5.3	Design of laterally supported beams against bending and shear.	1	
6	Design of Tubular Steel Structures:	2	
6.1	Round Tubular Sections, Permissible Stresses	3	
6.2	Tubular Compression & Tension Members		
6.3	Joints in Tubular trusses	2	
7	Design of Masonry Structures:	1	
7.1	Design considerations for Masonry walls & Columns, Load Bearing & Non-Load Bearing walls, Permissible stresses, Slenderness Ratio, Effective Length, Height & Thickness.		


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SUBJECT-R&BE	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	5 TH SEM	FACULTY NAME-SIBANI JENA
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
	Section – A: RAILWAYS		
1	Introduction		
1.1	Railway terminology		
1.2	Advantages of railways	1	
1.3	Classification of Indian Railways	1	
2	Permanent way	1	
2.1	Definition and components of a permanent way	1	
2.2	Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions	1	
3	Track materials	2	
3.1	Rails	1	
3.2	Functions and requirement of rails	1	
3.1.2	Types of rail sections, length of rails	1	
3.1.3	Rail joints – types, requirement of an ideal joint	1	
3.1.4	Purpose of welding of rails & its advantages	1	
3.1.5	Creep- definition, cause & prevention	1	
3.1.6	Sleepers	1	
3.1.7	Advantages & disadvantages of different types of sleepers	1	
3.1.8	Ballast	2	
3.1.9	Functions & requirements of ballast	2	
3.1.10	Materials for ballast	1	
3.2.1	Fixtures for Broad gauge	1	
3.2.2	Connection of rails to rail-fishplate, fish bolts	1	
3.2.3	Connection of rails to sleepers	1	
4	Geometric for broad gauge	1	
4.1	Typical cross – sections of single & double broad gauge railway track in cutting	2	
4.2	Permanent & temporary land width	1	
4.3	Gradients for drainage	1	
4.4	Super elevation – necessity & limiting valued	1	
5	Points and crossings	1	
5.1	Definition, necessity of Points and crossings	1	
5.2	Types of points & crossings with tie diagrams	1	
6	Laying & maintenance of track	1	
6.1	Methods of Laying & maintenance of track	1	
6.2	Duties of a permanent way inspector	1	
1	Section – B: BRIDGES		
1.1	Introduction to bridges, Definitions	1	
1.2	Components of a bridge	1	
1.3	Classification of bridges	1	
1.4	Requirements of an ideal bridge	2	
2	Bridge site investigation, hydrology & planning	1	
2.1	Selection of bridge site, Alignment,	1	
2.2	Determination of Flood Discharge	1	
2.3	Waterway & economic span	1	
2.4	4 Afflux, clearance & free board	1	
3	Bridge foundation	2	
3.1	Scour depth minimum depth of foundation	1	
3.2	Types of bridge foundations – spread foundation, pile foundation- well foundation – sinking of wells, caisson	1	

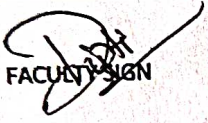
	foundation		
3.3	Coffer dams	1	
4	Bridge substructure and approaches	1	
4.1	Types of piers	1	
4.2	Types of abutments	1	
4.3	Types of wing walls	1	
4.4	Approaches	1	
5	Culvert & Cause ways	1	
5.1	Types of culvers – brief description	1	
5.2	Types of causeways – brief description	2	


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SUBJECT- ACTE	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	6 TH SEM	FACULTY NAME-DIPTI BIBHAR
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Advanced construction materials	1	
1.1	Fibers and Plastics Types of fibers- Steel, Carbon, glass fibers, Use of fibers as construction material, properties of Fibers. Types of plastics- PVC, RPVC, HDPE, FRP, GRP etc. Colored plastic sheets. Use of plastic as construction material.	2	
1.2	Artificial Timbers – Properties and uses of artificial timber. Types of artificial timber available in market, strength of artificial timber	2	
1.3	Miscellaneous materials – Properties and uses of acoustics materials, wall claddings, plaster boards, micro-silica, artificial sand, bonding agents, adhesives etc.	2	
2	Prefabrication	1	
2.1	Introduction, necessity and scope of prefabrication of buildings, history of prefabrication, current uses of prefabrication , types of prefabricated systems, classification of prefabrication, advantages and disadvantages of prefabrication,	2	
2.2	The theory and process of prefabrication, design principle of prefabricated systems, types of prefabricated elements, modular coordination	1	
2.3	Indian standard recommendation for modular planning	1	
3	Earthquake Resistant Construction	1	
3.1	Building Configuration	1	
3.2	Lateral Load resisting structures	1	
3.3	Building characteristics	1	
3.4	Effect of structural irregularities-vertical irregularities, plan configuration problems.	1	
3.5	Safety consideration during additional construction and alteration of existing Buildings.	2	
3.6	Additional strengthening measures in masonry building- corner reinforcement, lintel band, sill band, plinth band, roof band, gable band etc.	4	
4	Retrofitting of Structures	1	
4.1	Seismic retrofitting of reinforced concrete buildings :	2	
4.2	Sources of weakness in RC frame building	2	
4.3	Classification of retrofitting techniques and their uses	2	
5	Building Services	2	
5.1	Cold Water Distribution in high rise building, lay out of installation	3	
5.2	Hot water supply – General principles for central plants- layout	2	
5.3	3 Sanitation –soil and waste water installation in high rise buildings	2	
5.4	Electrical services – i) requirements in high rise buildings ii) Layout of wiring - types of wiring iii) Fuses and their types iv) Earthing and their uses	4	
5.5	Lighting – Requirement of lighting, Measurement of light intensity	2	
5.6	Ventilation - Methods of ventilation (Natural and artificial Systems of ventilation) problems on ventilation	2	
5.7	Mechanical Services- Lifts, Escalator, Elevators – types and uses.	2	

6	Construction and earth moving equipments –	1	
6.1	Planning and selection of construction equipments	2	
6.2	Study on earth moving equipments like drag line, tractor, bulldozer, Power shovel	1	
6.3	Study and uses of compacting equipments like tamping rollers, Smooth wheel rollers, Pneumatic tired rollers and vibrating compactors	2	
6.4	Owning and operating cost – problems	1	
7	Soil reinforcing techniques	1	
7.1	Necessity of soil reinforcing.	1	
7.2	Use wire mesh and geo-synthetics	1	
7.3	Strengthening of embankments, Slope stabilization in cutting and embankments by soil reinforcing techniques.	1	


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SUBJECT-CM	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	6 TH SEM	FACULTY NAME-SRABANEE GIRI
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	Introduction To Construction Management	1	
1.1	Aims and objectives of construction management.	1	
1.2	Functions of construction management	1	
1.3	The construction team componentsowner,engineer,archllect,contractor-their functions and interrelationship and jurisdiction	1	
1.4	Resources for construction management- men,machines,materials,money	1	
2	Constructional Planning	1	
2.1	Impotence of Construction Planning	1	
2.2	Developing work breakdown structure for construction work	1	
2.3	Construction Planning stages-Pre-tender stage, Post-tender stage	1	
2.4	Construction scheduling by Bar charts-preparation of Bar Charts for simple construction wo	1	
2.5	Preparation of schedules for labour materials,machinery, finance for small works	1	
2.6	Limitation of Bar charts	1	
2.7	Construction scheduling by network techniques-definition of terms ,PERT and CPM techniques, advantages and disadvantages of two techniques, network analysis, estimation of time and critical path, application of PERT and CPM techniques in sample construction works.	1	
3	Materials and Stores Management	1	
3.1	Classification of Stores-storage of stock	1	
3.2	Issue of materials-indent , invoice, bin card	1	
4	Construction Site Management	1	
4.1	Job Lay out-Objectives, Review plans, specifications, Lay out of equipments.	1	
4.2	Location of equipment, organizing labour at site.	1	
4.3	Job lay out for different construction sites.	1	
4.4	Principle of storing material at site.	1	
5	Construction Organization:	1	
5.1	Introduction – Characteristics, Structure, Importance	1	
5.2	Organization types-line and staff, functions and their characteristics	1	
5.3	Principles of organization- meaning and significance of terms- control, authority, responsibility, job & task.	1	
5.4	Leadership-necessity, styles of leadership, role of leader	1	
5.5	Human relations-relations with subordinates, peers, Supervisors, characteristics of group behavior, mob psychology, handling of grievances, absenteeism, labour welfare	1	
5.6	Conflicts in organization-genesis of conflicts, types- Intrapersonal, interpersonal, Intergroup, resolving conflicts	1	
6	Construction Labour and Labour Management:	1	
6.1	Preparing Labour schedule	1	
6.2	Essential steps for optimum labour output	1	
6.3	Labour characteristics	1	
6.4	Wages & their payment	1	
6.5	Labour Incentives	1	

6.6	Motivation- Classification of motives, different approaches to motivation	1	
7	Equipment Management	1	
7.1	Preparing the equipment schedule	1	
7.2	Identification of different alternative equipment	2	
7.3	Importance of Owning & operating costs in making decisions for hiring & purchase of equipment	1	
7.4	Inspection and testing of equipment	1	
7.5	Equipment maintenance	1	
8	Quality Control	1	
8.1	Concept of quality in construction	2	
8.2	Quality Standards- during construction, after construction, destructive & non destructive methods.	1	
9	Monitoring Progress	1	
9.1	Programme and progress of work	1	
9.2	Work study	1	
9.3	Analysis and control of physical and financial progress corrective measures.	1	
10	Safety Management In Construction	2	
10.1	Importance of safety	1	
10.2	causes and effects of accidents in construction works	1	
10.3	Safety measures in worksites for excavation, scaffolding, formwork, fabrication and erection, demolition.	1	
10.4	Development of safety consciousness	1	
10.5	Safety legislation- Workman's compensation act, contract labour act.	1	
11	Role of Vulnerability Atlas of India in construction projects	1	
11.1	Introduction to Vulnerability Atlas of India, Concepts of natural hazards and disasters and vulnerability profile of India. Definition of disaster related terms.	1	
11.2	Earthquake hazard and vulnerability, Magnitude and intensity scales of earthquake, seismic zones, earthquake hazard maps, types of structures and damage classification, effects in housing and resistant measures.	1	
11.3	Wind / Cyclone hazard and vulnerability, wind speed and pressures, wind hazard and cyclone occurrence maps, storm surveys and cyclone resistant measures.	1	
11.4	Flood hazard and vulnerability, Flood hazard and Flood prone areas of the country, General protection of habitants and flood resistant construction.	1	
11.5	Landslides, Tsunamis and Thunderstorm hazards and vulnerability, Landslide & Thunderstorm Incidence maps, Measures against Tsunami hazards.	1	
11.6	Housing vulnerability risk tables and usage of vulnerability atlas of India, Inclusion of vulnerability atlas in Tender documents.	1	

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SUBJECT-SURVEY-II	GANDHI INSTITUTE OF ADVANCE COMPUTER & RESEARCH	6 TH SEM	FACULTY NAME-SIBANI JENA
MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS REQUIRED	TENTATIVE DATE FOR COMPLETION
1	TACHEOMETRY:	1	
1.1	Principles, stadia constants determination	1	
1.2	Stadia tacheometry with staff held vertical and with line of collimation horizontal or inclined, numerical problems	3	
1.3	Elevations and distances of staff stations – numerical problems	2	
2	CURVES	1	
2.1	compound, reverse and transition curve, Purpose & use of different types of curves in field	1	
2.2	Elements of circular curves, numerical problems	1	
2.3	Preparation of curve table for setting out	2	
2.4	Setting out of circular curve by chain and tape and by instrument angular methods (i) offsets from long chord, (ii) successive bisection of arc, (iii) offsets from tangents, (iv) offsets from chord produced, (v) Rankine's method of tangent angles (No derivation)	5	
2.5	Obstacles in curve ranging – point of intersection inaccessible	1	
3	BASICS ON SCALE AND BASICS OF MAP:	1	
3.1	Fractional or Ratio Scale, Linear Scale, Graphical Scale	1	
3.2	What is Map, Map Scale and Map Projections	1	
3.3	How Maps Convey Location and Extent	1	
3.4	How Maps Convey characteristics of features	2	
3.5	How Maps Convey Spatial Relationship	2	
3.5.1	Classification of Maps Physical Map, Topographic Map, Road Map, Political Map Economic & Resources Map ,Thematic Map , Climate Map	3	
4	SURVEY OF INDIA MAP SERIES:	1	
4.1	Open Series map	2	
4.2	Defense Series Map	1	
4.3	Map Nomenclature Quadrangle Name ,Latitude, Longitude, UTM's Contour Lines Magnetic Declination Public Land Survey System Field Notes	2	
5	BASICS OF AERIAL PHOTOGRAPHY, PHOTOGRAMMETRY, DEM AND ORTHO IMAGE GENERATION:	2	
5.1	Aerial Photography: Film, Focal Length, Scale Types of Aerial Photographs (Oblique, Straight)	1	
5.2	Photogrammetry: Classification of Photogrammetry ,Aerial Photogrammetry Terrestrial Photogrammetry	3	
5.3	Photogrammetry Process: Acquisition of Imagery using aerial and satellite platform Control Survey Geometric Distortion in Imagery Application of Imagery and its support data Orientation and Triangulation Stereoscopic Measurement X-parallax Y-parallax DTM/DEM Generation Ortho Image Generation	4	
6	MODERN SURVEYING METHODS :	1	
6.1	Principles, features and use of (i) Micro-optic theodolite, digital theodolite	1	
6.2	Working principles of a Total Station (Set up and use of total station to measure angles, distances of points under survey from total station and the coordinates (N, Y & E or northing, easting, and elevation) of surveyed points relative to Total	2	

	Station position using trigonometry and triangulation.		
7	BASICS ON GPS & DGPS AND ETS:	2	
7.1	GPS: - Global Positioning Working Principle of GPS, GPS Signals, Errors of GPS, Positioning Methods	3	
7.2	DGPS: - Differential Global Positioning System Base Station Setup Rover GPS Set up Download, Post-Process and Export GPS data Sequence to download GPS data from flashcards Sequence to Post-Process GPS data Sequence to export post process GPS data Sequence to export GPS Time tags to file	3	
7.3	ETS: - Electronic Total Station Distance Measurement Angle Measurement Leveling Determining position Reference networks Errors and Accuracy	1	
8	BASICS OF GIS AND MAP PREPARATION USING GIS	1	
8.1	Components of GIS, Integration of Spatial and Attribute Information	3	
8.2	Three Views of Information System Database or Table View, Map View and Model View	2	
8.3	Spatial Data Model	1	
8.4	Attribute Data Management and Metadata Concept	2	
8.5	Prepare data and adding to Arc Map	1	
8.6	Organizing data as layers	1	
8.7	Editing the layers.	1	
8.8	Switching to Layout View	1	
8.9	Change page orientation.	1	
8.10	Removing Borders	1	
8.11	Adding and editing map information.	1	
8.12	Finalize the map	1	


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