Lession Plan 2024-25

APPLIED PHYSICS-II

Civil-2nd Semester

1St Sessional Exam 2024 UNIT I **Wave Motion and its Applications** 1.1 Waves: definition, types (mechanical and electromagnetic wave) 1.2 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 1.3 Simple harmonic motion (SHM): definition, examples 1.4 Cantilever: definition, formula of time period (without derivation) 1.5 Free, forced and resonant vibrations with examples 1.6 Sound waves: types (infrasonic, audible, ultrasonic) on the basis of frequency, noise, coefficient of absorption of sound, echo **UNIT II** **Optics** 2.1 Reflection and refraction of light with laws, refractive index 2.2 Lens: introduction, lens formulae (no derivation), power of lens and simple numerical problems 2.3 Total internal reflection and its applications, critical angle and conditions for total internal reflection 2.4 Superposition of waves (concept only), definition of Interference, Diffraction and Polarization of waves 2.5 Introduction to Microscope, Telescope and their applications	Upto-14-03-2024
2nd Sessional Exam 2024 **UNIT III** **Electrostatics and Electricity** 3.1 Electric charge, unit of charge, conservation of charge 3.2 Coulomb's law of electrostatics 3.3 Electric field, electric lines of force (definition and properties), electric field intensity due to a point charge 3.4 Definition of electric flux, Gauss law (statement and formula) 3.5 Capacitor and capacitance (with formula and unit) 3.6 Electric current and its SI Unit, direct and alternating current 3.7 Resistance, conductance (definition and unit) 3.8 Series and parallel combination of resistances 3.9 Ohm's law (statement and formula) **UNIT IV** **Classification of Materials and their Properties**	Upto-24-04-2024

4.1 Definition of energy level, energy bands 4.2 Types of materials (conductor, semiconductor, insulator and dielectric) with examples, intrinsic and extrinsic semiconductors (introduction only) 4.3 Introduction to magnetism, type of magnetic materials: diamagnetic, paramagnetic and ferromagnetic materials with examples 4.4 Magnetic field, magnetic lines of force, magnetic flux 4.5 Electromagnetic induction (definition)	
3rd Sessional Exam 2024 **UNIT V** **Modern Physics** 5.1 Laser: introduction, principle, absorption, spontaneous emission, stimulated emission, population inversion 5.2 Engineering and medical applications of laser 5.3 Fibre optics**:** introduction to optical fibers (definition, principle and parts), light propagation, fiber types (mono-mode, multi-mode), applications in medical, telecommunication and sensors 5.4 Nanotechnology: introduction, definition of nanomaterials with examples, properties at nano scale, applications of nanotechnology (brief)	Upto-25-05-2024

APPLIED MATHEMATICS – II

1St Sessional Exam 2024 UNIT I **Differential Calculus** 1.1 Definition of function; Concept of limits (Introduction only) and problems related to four standard limits only. 1.2 Differentiation of x_n, sin x, cos x, e_x by first principle. 1.3 Differentiation of sum, product and quotient of functions **UNIT II** **Differential Calculus and Its Applications** 2.1 Differentiation of trigonometric functions, inverse trigonometric functions. Logarithmic differentiation, successive differentiation (upto 2nd order) 2.2 Application of differential calculus in: (a) Rate measures (b) Maxima and minima	Upto-14-03-2024

2nd Sessional Exam 2024 **UNIT III** **Integral Calculus** 3.1 Integration as inverse operation of differentiation with simple examples. 3.2 Simple standard integrals and related problems, Integration by Substitution method and Integration by parts. 3.3 Evaluation of definite integrals with given limits. $\pi/2$ π /2 $\pi/2$ Evaluation of $\int \sin^n x.\, dx$, $\int \cos^n x\, dx$, $\int \sin^m x \cos^n x\, dx$ 0 0 0 using formulae without proof (m and n being positive integers only) using pre-existing mathematical models. **UNIT IV** **Application of Integration, Numerical Integration and Differential Equations** 4.1 Applications of integration: for evaluation of area under a curve and axes (Simple problems). 4.2 Numerical integration by Trapezoidal Rule and Simpson's 1/3rd Rule using pre-existing mathematical models. **Differential Equations** 4.3 Definition, order, degree, Type of differential Equations, linearity, Formulation of ordinary differential equation (up to 1st order), solution of ODE (1st order) by variable separation method.	Upto-24-04-2024
3rd Sessional Exam 2024 **UNIT V** **Statistics and Software Statistics** 5.1 Measures of Central Tendency: Mean, Median, Mode 5.2 Measures of Dispersion: Mean deviation, Standard deviation **Software** 5.3 SciLab software – Theoretical Introduction. 5.4 Basic difference between MATLAB and SciLab software, 5.5 Calculations with MATLAB or ScilLab - (a) Representation of matrix (2×2 order), (b) Addition, Subtraction of matrices (2×2 order) in MATLAB or SciLab	Upto-25-05-2024

CIVIL ENGINEERING PRACTICES

1St Sessional Exam 2024 **BUILDING DRAWING(Part A)** **Drawing No. 1** Details of spread footing foundations, load bearing and non-load bearing wall for given thickness of walls with the help of given data or rule of the thumb, showing offsets, position of DPC. The details of the concrete and brick apron have to be shown in the drawing. **Drawing No. 2** Plans of 'T' and Corner junction of walls of 1 Brick, 1-1/2 Brick and 2 brick thick in English bond. **Drawing No. 3** Drawing plan, elevation of arches: circular arch, segmental arch (one sheet) **Drawing No. 4** Elevation, sectional plan and sectional side elevation of flush door, glazed door, panelled door with wire gauge shutter.	Upto-14-03-2024
2nd Sessional Exam 2024 **Drawing No. 5** Drawing details of damp proofing arrangement of roofs and walls as per BIS Code. Show the rain water drainage arrangement also. **Drawing No. 6** Drawing Damp Proofing details in basement of buildings **IRRIGATION ENGINEERING DRAWING (Part B)** **Drawing No. 7** Typical cross-section of a channel - L-section of a channel for given data - Typical cross section of an unlined and lined channel in cutting, partly cutting, and partly filling and fully in filling with given design data. **Drawing No. 8** Layout plan of a canal head works	Upto-24-04-2024
3rd Sessional Exam 2024 **Drawing No. 9** Draw the typical L-section of a weir **Drawing No. 10** Draw the X-section of an Earthen Dam i) Homogeneous ii) Zoned type iii) Diaphragm type **Drawing No. 11** Cross section of a tube well **Drawing No. 12** Layout and cross section of rain water harvesting system..	Upto-25-05-2024

CONSTRUCTION MATERIALS

1St Sessional Exam 2024 UNIT I **1. Building Stones** 1.1 Sources of Stones 1.2 Quarrying of stones by blasting and its effect on environment 1.3 Dressing of stones 1.4 Requirements of good building stones 1.5 Various uses of stones in construction 1.6Artificial Stones: Procedure of making an artificial stone, forms of artificial stones, advantages of artificial stones. **2. Bricks** 2.1 Introduction to bricks 2.2 Raw materials for brick manufacturing and properties of good brick making earth 2.3 Manufacturing of bricks 2.3.1 Preparation of clay (Manual and Mechanically) **2.3.2 Moulding: Hand moulding and machine moulding brick table; drying of bricks, 2.4 Burning of bricks: Bull's Trench Kiln, Hoffman's Kiln and Zig- Zag Kiln (only line diagram of kilns) 2.5 Sun dried bricks, Traditional bricks, Refractory bricks, Fly ash bricks, Hollow bricks, 2.6 Size and weight of standard brick 2.7 Classification and specifications of bricks as per BIS: 1077 2.8 Stacking of bricks and tiles at site **UNIT II** **3. Tiles** 3.1 Brick tiles and their uses 3.2 Ceramic tiles and their uses 3.3 Vitrified tiles and their uses 3.4 PVC Tiles and uses, 3.5 Paver blocks, interlocking tiles **4. Cement** **4.1 Introduction, raw materials, flow diagram of manufacturing of cement 4.2 Various types of cements, their uses and testing: Ordinary portland cement, rapid hardening cement, White cement, Portland pozzolana cement 4.3 Properties of cement 4.4 Storage of Cement at site	Upto-14-03-2024

2nd Sessional Exam 2024 **UNIT III** **5. Timber and Wood Based Products** 5.1 Identification and uses of different types of timber: Teak, Deodar, Shisham, Sal, Mango, Kail, Chir, Fir, Hollock, Champ ** 5.2 Seasoning of timber: Purpose, methods of seasoning as per BIS Code 5.3 Properties of timber and specifications of structural timber 5.4 Preservation of timber and methods of treatment as per BIS 5.5 Other wood based products, their brief description of manufacture and uses: Laminated Board, Block Board, Fibre Board, Hard board, Sunmica, Plywood, and Veneers **6. Paints, Varnishes and Distempers:** 6.1 Paints 6.1.1 Purpose and use of paints 6.1.2 Characteristics of an ideal paint 6.1.3 Types of paints: Oil paints, Water paints, Cement paints and Enamel paint** 6.1.4 Covering capacity of paints 6.2 Varnishes 6.2.1 Purpose and use of varnishes 6.2.2 Characteristics of an ideal varnish 6.2.3 Types of varnishes 6.3 Distemper 6.3.1 Properties of distemper and process of distempering. **UNIT IV** **7. Metals and Non Metals** 7.1 Ferrous metals: Composition, properties and uses of cast iron, mild steel, HYSD steel, high tension steel as per BIS. 7.2 Commercial forms of ferrous, metals. 7.3 Properties and use of Aluminium 7.4 Properties and use of Stainless Steel. **8. Plastics** 8.1 FRP: Introduction, Properties of FRP and Applications of FRP in Building Industry 8.2 PVC wall paneling 8.3 ACP and HPL Sheets	Upto-24-04-2024
3rd Sessional Exam 2024 **UNIT V** **9. Miscellaneous Materials** 9.1 Asbestos: Introduction, properties and use of asbestos. 9.2 Types and uses of insulating materials for sound and thermal insulation 9.3 Construction chemicals like water proofing compound, epoxies, polymers 9.4 Water proofing and termite proofing materials – types and uses	Upto-25-05-2024

9.5 Materials used in interior decoration works like POP, methods of doing POP 9.6 Eco friendly materials for construction of buildings.	

FUNDAMENTALS OF IT

1St Sessional Exam 2024 **UNIT I** **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) **UNIT II** **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	Upto-14-03-2024
2nd Sessional Exam 2024 **Unit III** **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 **Unit IV** **Office Tools** Office Tools like LibreOffice/Open Office/MSOffice. Open Office Writer – Typesetting Text and Basic Formatting, Inserting Images, Hyperlinks, Bookmarks, Tables and Table Properties in Writer Introducing LibreOffice/Open Office*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	Upto-24-04-2024
3rd Sessional Exam 2024 **Unit V** **Use of Social Media** Introduction to Digital Marketing – Why Digital Marketing, Characteristics of Digital Marketing, Tools for Digital Marketing, ,	Upto-25-05-2024

Effective use of Social Media like LinkedIn, Google+, Facebook, Twitter, etc.: Features of Social media, Advantages and Disadvantages of Social Media. 1.7 Clinical Importance .	

APPLIED MECHANICS

1St Sessional Exam 2024 UNIT 1 **1. Introduction** Concept of mechanics, Classification of mechanics, utility of mechanics in engineering field, Concept of rigid body, scalar and vector quantities. **2. Laws of forces** Definition of force, measurement of force in SI units, its representation, types of force: Point force/concentrated force & Uniformly distributed force, effects of force, characteristics of a force, Different force systems (coplanar and non-coplanar), principle of transmissibility of forces, law of superposition, Free body diagram, Composition and resolution of coplanar concurrent forces, resultant force, method of composition of forces, laws of forces, parallelogram law of forces (with derivation), triangle law of forces, polygon law of forces - graphically, analytically, resolution of forces, resolving a force into two rectangular components, Lami's theorem, Simple numericals, Equilibrium of forces and its determination. **UNIT II** **3. Moment** Concept of moment, Moment of a force and units of moment, Varignon's theorem (definition only), Principle of moment and its applications (Levers – simple and compound, steel yard, safety valve), Simple numericals. Parallel forces (like and unlike parallel force), calculating their resultant, Concept of couple, its properties and effects, General conditions of equilibrium of bodies under coplanar forces, Position of resultant force by moment.	Upto-14-03-2024
2nd Sessional Exam 2024 **UNIT III** **4. Friction** Definition and concept of friction, types of friction, force of friction, Laws of static friction, coefficient of friction, angle of friction, angle of repose, cone of friction, Equilibrium of a body lying on a horizontal plane, equilibrium of a body lying on a rough inclined plane. Calculation of least force required to maintain equilibrium of a body on a rough inclined plane subjected to a force acting along the inclined plane and subjected to a force acting at some angle with the inclined plane, Simple numericals. **UNIT IV** **5. Centre of Gravity and Centroid**	Upto-24-04-2024

Concept, definition of centroid of plain figures and centre of gravity of symmetrical solid bodies. Axis of symmetry, Reference axis. Determination of centroid of plain and composite lamina (T, L, C and I shape) using moment method only, centroid of bodies with removed portion. Determination of center of gravity of solid bodies - cone, cylinder, hemisphere and sphere; composite bodies and bodies with portion removed. **6. Laws of Motion** Newton's laws of motion and their applications, Concept of momentum. Derivation of force equation from second law of motion, numerical problems on second law of motion. Bodies tied with string, Newton's third law of motion, numerical problems, conservation of momentum, impulse and impulsive force.	
3rd Sessional Exam 2024 **UNIT V** **7. Simple Machines** Definition of effort, velocity ratio, mechanical advantage and efficiency of a machine and their relationship, law of machines, Simple and compound machine (Examples). Definition of ideal machine, reversible and self-locking machine. Effort lost in friction, Load lost in friction, determination of maximum mechanical advantage and maximum efficiency, Simple numerical System of pulleys (first, second, third system of pulleys), determination of velocity ratio, mechanical advantage and efficiency. Working principle and application of wheel and axle, Weston's Differential Pulley Block, simple screw jack, worm and worm wheel, single and double winch crab. Expression for their velocity ratio and field of their application	Upto-25-05-2024

ENVIRONMENTAL STUDIES

1St Sessional Exam 2024 UNIT I **Introduction** 1.1 Basics of ecology, eco system- concept, and sustainable development, Sources, advantages, disadvantages of renewable and nonrenewable energy. 1.2 Rain water harvesting 1.3 Deforestation – its effects & control measures **UNIT II** **Air and Noise Pollution** 2.1 Air Pollution: Source of air pollution. Effect of air pollution on human health, economy, Air pollution control methods.	Upto-14-03-2024
2nd Sessional Exam 2024 **UNIT III** **Water and Soil Pollution** 3.1 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. 3.2 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 **UNIT IV** **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.	Upto-24-04-2024
3rd Sessional Exam 2024 **UNIT V** **Disaster Management** **A.** 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. **B.** Disaster Preparedness: Disaster Preparedness Plan Prediction, Early Warnings and Safety Measures of Disaster Psychological response and Management (Trauma, Stress, Rumour and Panic	Upto-25-05-2024

Lession Plan 2024-25

ENGLISH AND COMMUNICATION SKILLS - II

Civil-4th Semester

1St Sessional Exam 2024 **UNIT I** **Reading** 1.1 All The World's A Stage – W. Shakespeare 1.2 Life Sketch of Dr. Abdul Kalam 1.3 The Portrait of a Lady - Khushwant Singh 1.4 The Doctor's Word by R K Narayan 1.5 Speech by Dr Kiran Bedi at IIM Indore2007 Leadership Concepts 1.6 The Bet - by Anton Chekov **UNIT II** **Effective Communication Skills** 2.1 Modern means of Communication (Video Conferencing, e- mail, Teleconferencing) 2.2 Effective Communication Skills: 7 C's of Communication 2.3 Non-verbal Communication – Significance, Types and Techniques for Effective Communication 2.4 Barriers and Effectiveness in Listening Skills 2.5 Barriers and Effectiveness in Speaking Skills	Upto-14-03-2024
2nd Sessional Exam 2024 **UNIT III** **Professional Writing** 3.1 Correspondence: Enquiry letters, placing orders, complaint letters 3.2 Report Writing 3.3 Memos 3.4 Circulars 3.5 Press Release 3.6 Inspection Notes and tips for Note-taking 3.7 Corrigendum writing 3.8 Cover Letter 3.9 Drawing inferences **UNIT IV** **Grammar and Vocabulary** 4.1 Prepositions 4.2 Conjunctions 4.3 Punctuation 4.4 Idioms and Phrases	Upto-24-04-2024

4.5 Pairs of words (Words commonly misused and confused) 4.6 Translation of Administrative and Technical Terms in Hindi or Mother	
3rd Sessional Exam 2024 **UNIT V** **Employability Skills** 5.1 Presentation Skills: How to prepare and deliver a good presentation 5.2 Telephone Etiquettes 5.3 Importance of developing employable and soft skills	Upto-25-05-2024

SURVEYING – II

1St Sessional Exam 2024 **UNIT I** **Electronic Digital Theodolite and Tachometric surveying** 1.1 Concept/Difference of Transit Theodolite and Electronic Digital Theodolite 1.2 Temporary adjustments of an Electronic Digital Theodolite, Concept of transiting, swinging, face left, face right and changing face. 1.3 Prolonging a line (forward and backward) 1.4 Traversing by included angles and deflection angle method 1.5 Plotting a traverse; concept of coordinate and solution of omitted measurements (one side affected) 1.6 Errors in theodolite survey and precautions taken to minimize them 1.7 Height of objects with and without accessible bases 1.8 Concept, general principles of stadia tachometry and methods of tachometry and (with numerical problems) 1.9 Instruments to be used in tachometry **UNIT II** **Curves: (Horizontal, Vertical and Transition Curve)** 2.1 Definition and types of horizontal curve **2.1.1 Elements of simple circular curve - Degree of the curve, radius of the curve, tangent length, point of intersection (Apex point), tangent point, length of curve, long chord deflection angle, Apex distance and Mid- ordinate. (With numerical problems) 2.2 Transition Curve: 2.2.1 Definition of transition curve 2.2.2 Requirements of transition curve 2.2.3 Length of transition curve for roads; by cubic parabola 2.2.4 Need (centrifugal force and super elevation). 2.2.5 Calculation of offsets for a transition curve 2.3 Definition and types of vertical curve 2.3.1 Types of vertical curves 2.3.2 Setting out of a vertical curve	Upto-14-03-2024

2nd Sessional Exam 2024 **UNIT III** **Introduction of Advanced Surveying Equipment and Techniques.** 3.1 Principle of EDM, its component parts and their functions 3.2 Uses of EDM 3.3 Distomat 3.4 Remote sensing system 3.5 Application of remote sensing system in civil engineering, land uses/land cover, mapping, and disaster management 3.6 GPS, DGPS and GIS applications and software used (introduction only) 3.7 Planimeter (Digital) 3.8 Introduction of Drones Survey. **UNIT IV** **Total Station (TS)** 4.1 Concept and uses of TS 4.2 Uses of function keys, various parts of TS 4.3 Accessories used in TS survey 4.4 Applications of TS in various engineering area. 4.5 Temporary adjustments of TS 4.6 Measurement of horizontal angle, vertical angle distance and coordinates using Total station, Traversing, profile survey and contouring with TS 4.7 Errors in TS **4.8 Layout of any building, school, college, factory etc. with total station showing topographic map also.	Upto-24-04-2024
3rd Sessional Exam 2024 **UNIT V** **DGPS (Differential Global Positioning System)** 5.1 Concept of DGPS, various parts, applications and software used for DGPS 5.2 Comparison between DGPS and TS 5.3 Temporary adjustments of a DGPS 5.4 How does DGPS work 5.5 Errors in DGPS **5.6 Periodic field visits to Survey of India and other government agencies. **5.7 Layout of drain, canal, road with DGPS. **5.8 Demarcation of roads, plots, commercial spaces and agricultural land etc. with DGPS	Upto-25-05-2024

WATER SUPPLY AND WASTE WATER ENGINEERING

1St Sessional Exam 2024 **UNIT I** **Quantity and Quality of Water** 1.1 Necessity and brief description of planned water supply system. 1.2 Sources of water – surface/sub-surface sources (only description) 1.3 Water requirement, Per capita demand, Factors affecting per capita demand 1.4 Rate of demand and variation in rate of demand 1.5 Design Period, Factors governing the design period, Design period values for different components of a water supply scheme 1.6 Population forecasting methods (with Numerical Problems) 1.7 Physical, Chemical and bacteriological tests and their significance **UNIT II** **Water Treatment** **2.1 Sedimentation - Purpose, Types of sedimentation tanks **2.2 Coagulation / Flocculation - usual coagulation and their feeding **2.3 Filtration - Slow and Rapid sand filters, their significance and suitability 2.4 Necessity of disinfection of water, forms of chlorination, break point chlorine, residual chlorine, application of chlorine. 2.5 Miscellaneous Treatments – Aeration, Aquaguard, Reverse Osmosis System	Upto-14-03-2024
2nd Sessional Exam 2024 **UNIT III** **Water Distribution System** 3.1 Requirement of a good water distribution system 3.2 Layout of distribution networks 3.3 Methods of distribution 3.4 Distribution reservoirs – their functions and types 3.5 Storage capacity of distribution reservoirs 3.6 Stand Pipes **B. WASTE WATER ENGINEERING** **UNIT IV** **Waste Water Disposal** 4.1 Sanitation – Purpose and necessity of sanitation 4.2 Components of sewerage system - Manhole 4.3 Types of sewage and types of sewerage system 4.4 Properties of sewage and IS standards for analysis of sewage 4.5 Physical, chemical and bacteriological parameters of sewage 4.6 Sewage disposal methods - Disposal by dilution and land treatment 4.7 Self-purification of stream, Nuisance due to disposal	Upto-24-04-2024

3rd Sessional Exam 2024 **UNIT V** **Sewage Treatment** 5.1 Primary and secondary treatment 5.2 Screens, Grit chambers, Skimming tanks 5.3 Plain sedimentation tanks	Upto-25-05-2024

SOIL MECHANICS AND FOUNDATION ENGINEERING

1St Sessional Exam 2024 **UNIT I** **1. Introduction** 1.1 Importance of Soil Studies in Civil Engineering 1.2 Geological origin of soils with special reference to soil profiles in India: residual and transported soil, alluvial deposits, lake deposits, local soil found in Punjab, dunes and loess, glacial deposits, black cotton soils, conditions in which above deposits are formed and their engineering characteristics. 1.3 Names of organizations dealing with soil engineering work in India, soil map of India **2. Physical Properties of Soils** 2.1 Constituents of soil and representation by a phase diagram 2.2 Definitions of void ratio, porosity, degree of saturation, water content, specific gravity, unit weight, bulk density/bulk unit weight, dry unit weight, saturated unit weight and submerged unit weight of soil grains **UNIT II** **3. Classification and Identification of Soils** 3.1. Particle size, shape, and their effect on engineering properties of soil, particle size classification of soils 3.2. Gradation and its influence on engineering properties 3.3 Relative density and its use in describing cohesionless soils 3.4 Behaviour of cohesive soils with change in water content, Atterberg's limit - definitions, use and practical significance 3.5 Field identification tests for soils **4. Flow of Water Through Soils** 4.1 Concept of permeability and its importance 4.2 Darcy's law, coefficient of permeability, seepage velocity and factors affecting permeability 4.3 Comparison of permeability of different soils as per BIS 4.4 Measurement of permeability in the laboratory	Upto-14-03-2024

2nd Sessional Exam 2024 **UNIT III** **5. Effective Stress: (Concept only)** 5.1 Stresses in subsoil 5.2 Definition and meaning of total stress, effective stress and neutral stress 5.3 Principle of effective stress 5.4 Importance of effective stress in engineering problems **6. Deformation of Soils** 6.1 Meaning, conditions/situations of occurrence with emphasis on practical significance of: a) Consolidation and settlement b) Creep c) Plastic flow d) Heaving e) Lateral movement f) Freeze and thaw of soil 4.6 Clinical significance / applications of Chromatography **UNIT IV** **7. Shear Strength of Soil** 7.1. Concept and Significance of shear strength 7.2 Factors contributing to shear strength of cohesive and cohesion less soils, Coulomb's law **8. Compaction** 8.1 Definition and necessity of compaction 8.2 Laboratory compaction test (standard and modified proctor test as per IS) definition and importance of optimum water content, maximum dry density; moisture dry density relationship for typical soils with different compactive efforts 8.3. Compaction control; Density control, measurement of field density by core cutter method and sand replacement method, moisture control, Proctor's needle and its use, thickness control **9. Soil Exploration** 9.1 Purpose and necessity of soil exploration 9.2 Reconnaissance, methods of soil exploration, Trial pits, borings (auger, wash, rotary, percussion to be briefly dealt) 9.3 Sampling; undisturbed, disturbed, and representative samples; selection of type of sample; thin wall and piston samples; area ratio, recovery ratio of samples and their significance, number, and quantity of samples, resetting, sealing and preservation of samples. 9.4 Presentation of soil investigation results	Upto-24-04-2024
3rd Sessional Exam 2024 **UNIT V** **UNIT V** **10 Bearing Capacity of soil** 10.1 Concept of bearing capacity 10.2 Definition and significance of ultimate bearing capacity, net safe bearing capacity and allowable bearing pressure 10.3 Factors affecting bearing capacity. 10.4 Improvement of bearing capacity by sand drain method, compaction, use of geo- synthetics. **11. Foundation Engineering** 11.1 Concept of shallow and deep foundation. 11.2 types of shallow foundations: combined, isolated, strip, mat, and their suitability. 11.3 Factors affecting the depth of shallow foundations, deep	Upto-25-05-2024

foundations, 11.4 type of piles and their suitability; pile classification based on material, pile group and pile cap**.**	

IRRIGATION ENGINEERING

1St Sessional Exam 2024 **UNIT I** **1. Introduction: Irrigation Engineering, Hydrological Cycle, Run-off and Catchment Area** 1.1 Definition and necessity of irrigation 1.2 Major, medium and minor irrigation projects 1.3 Hydrology and hydrological cycle 1.4 Rain-gauges – automatic and non-automatic (Symons rain gauge) 1.5 Methods of estimating average rainfall (Arithmetic system) 1.6 Runoff and Factors affecting runoff, Catchment area 1.7 Hydrograph and basic concept of unit hydrograph **UNIT II** **2. Water Requirement of Crops** 2.1 Principal crops in India and their water requirements 2.2 Crop seasons – Kharif and Rabi 2.3 Crop period, base period, Duty, Delta and their relationship. 2.4 Gross commanded area (GCA), culturable commanded area (CCA), Intensity of Irrigation, Irrigable area **3. Methods of Irrigation** 3.1 Flow irrigation – Definition and its types (only description) 3.2 Lift Irrigation – Tube well, Types of tube wells (only description) 3.3 Explanation of terms: water table, radius of influence, depression head, cone of depression, confined and unconfined aquifers, advantages and disadvantages of tube well irrigation. 3.4 Sprinkler irrigation- Conditions favourable, Types and component parts, advantages and disadvantages of sprinkler irrigation. 3.5 Drip irrigation- layout, component parts, advantages and disadvantages of drip irrigation	Upto-14-03-2024
2nd Sessional Exam 2024 **UNIT III** **4. Canals , Canal Head Works, Regulatory Works and Cross Drainage Works** 4.1 Definition and Classification of canal. (Visit to a Canal) **4.2 Appurtenances of a canal and their functions. 4.3 Various types of canal lining - their related advantages and disadvantages, 4.4 Canal breaches and their control. 4.5 Maintenance of lined and unlined canals 4.6 Definition, objectives and general layout of different parts of head works. 4.7 Difference between weir and barrage **4.8 Definition and necessity of Cross Drainage Works (Visit to a Cross	Upto-24-04-2024

Drainage Works) **4.9 Concept of Aqueduct, super passage, level crossing, inlet and outlet. **UNIT IV** **5. Dams and hydraulic Structures** 5.1 Dam and its Classification **5.2 Earth dams - types, causes of failure; cross-section of zoned earth dam, method of construction, **5.3 Gravity dams – types, cross-sections of a dam, method of construction 5.4 Concept of spillways and energy dissipators	
3rd Sessional Exam 2024 **UNIT V** **6. River Training Works** 6.1 Definition, function of river training works. 6.2 Types of river training- Embankments or levees. 6.3 Concept of Guide bank, Groynes or spurs, Pitched island, Cut-off **7. Water Logging and Drainage and Ground Water Re-charge** 7.1 Definition of water logging – its causes and effects. 7.2 Detection, prevention and remedies 7.3 Surface and sub-surface drains and their layout (only description) 7.4 Water Harvesting Techniques: Need and requirement. 7.5 Various methods of rain water harvesting.	Upto-25-05-2024

Lession Plan 2024-25

Civil-6th Semester

STEEL STRUCTURES DESIGN AND DRAWING

1St Sessional Exam 2024 1. Structural Steel and Sections: (02 Hours) 1.1 Properties of structural steel as per IS Code 1.2 Designation of structural steel sections as per IS handbook and IS:800 2. Riveted Connections (04 Hours) Types of Rivet, Permissible stresses in rivets, types of riveted joints, specifications as per IS800, Failure of riveted joint, strength and efficiency of riveted joint, Design of Riveted Connection only axially loaded number (No staggered rivetting) 3. Bolt Connections: (04 Hours) Types of bolt, permissible stresses in bolt, types of bolted joints, specifications for bolted joints as per IS 800. Failure of a bolted joint. Assumptions in the theory of bolted joints. Strength and efficiency of a bolted joint. Design of bolted joints for axially loaded members (No Staggered bolts). 4. Welded connections: (04 Hours) Types of welds and welded joints, advantages and disadvantages of welded joints design of fillet and butt weld for axially loaded members	Upto-14-03-2024
2nd Sessional Exam 2024 5. Tension Members (14 Hours) Analysis and design of single and double section tension members and their rivetted and welded connections with gusset plate as per IS:800-2007 6. Compression Members (14 Hours) Analysis and design of single and double angle sections compression members subjected to axial load 7. Roof Trusses (05 Hours) Form of trusses, pitch of roof truss, spacing of trusses, spacing of purlins, connection between purlin and roof covering. Connection between purlin and principal rafter (no design, only concept) 8. Column Bases: (07 Hours) Types of column bases i.e. slab base, gusseted base.Concept of buckling, effective length, slenderness ratio, Analysis and Design of axially loaded single section column.	Upto-24-04-2024
3rd Sessional Exam 2024 9. Beams (08 Hours) Analysis and design of single section simply supported laterally restrained steel beams. Introduction to plate girder and functions of various elements of a plate girder 10. Fabrication and erection of steel structures like trusses, columns and girders (02 Hours) **Steel Structures Drawings:** Structural drawing from given data for following steel structural elements.	Upto-25-05-2024

(i) Drawing No. 1: Roof Truss – Drawing of Fink Roof Truss with details of joints, fixing details of purlins and roof sheets. (ii) Drawing No.2 : Column and Column Bases - Drawing of splicing of steel columns. Drawings of slab base, gusseted base and grillage base for single section steel columns. (iii) Drawing No.3 : Column Beam Connections (a) Sealed and Framed Beam to Beam Connections (b) Sealed and Framed Beam o Column Connections (iv) Drawing No. 4 : Plate Girder (Bolted) Plan and Elevation of Plate Girder with details at supports and connection of stiffness, flange angles and cover plate with web highlighting curtailment of plates. (v) Drawing No. 5 : Draw atleast one sheet using CAD software	

EARTHQUAKE RESISTANT BUILDING CONSTRUCTION

1St Sessional Exam 2024 1. Elements of Engineering Seismology (08 Hours) General features of tectonic of seismic regions. Causes of earthquakes, Seismic waves, earthquake size (magnitude and intensity), Epicentre, Seismograph, Classification of earthquakes, Seismic zoning map of India, Static and Dynamic Loading, Fundamental period. 2. Seismic Behaviour of Traditionally-Built Constructions of India (07 Hours) Performance of building during earthquakes and Mode of failure (Out-of-plane failure, in-plane failure, Diaphragm failure, Connection failure, Non-structural components failure)	Upto-14-03-2024
2nd Sessional Exam 2024 3. Special construction method, tips and precautions to be observed while planning, designing and construction of earthquake resistant building. 4. Introduction to seismic zone of India and factors related to IS:1893 and IS: 13920 (latest edition)	Upto-24-04-2024
3rd Sessional Exam 2024 5. Seismic provision of strengthening and retrofitting measures for traditionally-built constructions (08 Hours) 6. Provision of reinforcement detailing in masonry and RCC constructions (06 Hours) 7. Disaster Management: Disaster rescue, psychology of rescue, rescue workers, rescue plan, rescue by steps, rescue equipment, safety in rescue operations, debris clearance and casuality management. (06 Hours)	Upto-25-05-2024

QUANTITY SURVEYING & VALUATION

1St Sessional Exam 2024 1. Introduction to quantity surveying and its importance. Duties of quantity surveyor (02 Hours) 2. Types of estimates (02 Hours) 2.1 Preliminary estimates - Plinth area estimate - Cubic content estimate 2.2 Detailed estimates - Definition - Stages of preparation – details of measurement and calculation of quantities and abstract 3. Measurement (07 Hours) 3.1 Units of measurement for various items of work as per BIS:1200 3.2 Rules for measurements	Upto-14-03-2024
4. Preparation of Detailed and Abstract Estimates from Drawings by following CSR rates for: (20 Hours) 4.1 A small residential building with a flat roof comprising of - Two rooms with W.C., bath, kitchen and verandah 4.2 Earthwork for unlined channel 4.3 WBM road and pre-mix carpeting 4.4 Single span RCC slab culvert 4.5 Earthwork for plain and hill roads 4.6 RCC work in beams, slab, column and lintel, foundations 4.7 10 users septic tank 5. Calculation of quantities of materials for (05 Hours) 5.1 Cement mortars of different proportion 5.2 Cement concrete of different proportion 5.3 Brick/stone masonry in cement mortar of different proportion 5.4 Plastering, pointing and painting 5.5 D.P.C. and flooring	Upto-24-04-2024

6. Analysis of Rates (08 Hours) 6.1 Steps involved in the analysis of rates. Requirement of material, labour, sundries, contractor's profit and overheads 6.2 Analysis of rates for finished items when data regarding labour, rates of material and labour is given: - Earthwork in excavation in hard/ordinary soil and filling with a concept of lead and lift - RCC in roof slab/beam/lintels/columns - Brick masonry in cement mortar - Cement Plaster - White washing, painting	
3rd Sessional Exam 2024 7 Contractorship (05 Hours) - Meaning of contract - Essentials of a contract - Types of contracts, their advantages, dis-advantages and suitability, system of payment Single and two cover-bids; tender, tender forms and documents, tender notice, submission of tender and deposit of earnest money, security deposit, retention money, maintenance period - Classification and types of contracting firms/construction companies 8 Preparation of Tender Document based on Common Schedule Rates (CSR) (10 Hours) - Introduction to CSR and calculation of cost based on premium on CSR - Exercises on writing detailed specifications of different types of building works from excavation to foundations, superstructure and finishing operation - Exercises on preparing tender documents for the following a) Earth work b) Construction of a small house as per given drawing c) RCC works d) Pointing, plastering and flooring e) White-washing, distempering and painting f) Wood work including polishing g) Sanitary and water supply installations h) False ceiling, aluminum (glazed) partitioning i) Tile flooring including base course j) Preparation of comparative statement for item rate contract. 9. Valuation (05 Hours) a) Purpose of valuation, principles of valuation b) Definition of various terms related to valuation like depreciation, sinking fund, salvage and scrap value, market value, fair rent, year's purchase etc. c) Methods of valuation (i) replacement cost method (ii) rental return method	Upto-25-05-2024

CONSTRUCTION MANAGEMENT AND ACCOUNTS

1St Sessional Exam 2024 1. Introduction: (06 Hours) 1.1 Significance of construction management 1.2 Main objectives of construction management and overview of the subject 1.3 Functions of construction management, planning, organising, staffing, directing, controlling and coordinating, meaning of each of these with respect to construction job. 1.4 Classification of construction into light, heavy and industrial construction 1.5 Stages in construction from conception to completion 1.6 The construction team: owner, engineer, architect and contractors, their functions and inter-relationship 2. Construction Planning: (12 Hours) 2.1 Importance of construction planning Stages of construction planning - Pre-tender stage - Contract stage 2.2 Scheduling construction works by bar charts - Definition of activity, identification of activities though - Preparation of bar charts for simple construction work - Preparation of schedules for labour, materials, machinery and finances for small works - Limitations of bar charts 2.3 Scheduling by network techniques - Introduction to network techniques; PERT and CPM, differences between PERT and CPM terminology 3. Organization: (06 Hours) 3.1 Types of organizations: Line, line and staff, functional and their characteristics	Upto-14-03-2024
2nd Sessional Exam 2024 4. Site Organization: (06 Hours) 4.1 Principle of storing and stacking materials at site 4.2 Location of equipment 4.3 Preparation of actual job layout for a building 4.4 Organizing labour at site 5. Construction Labour: (06 Hours) 5.1 Conditions of construction workers in India, wages paid to workers 5.2 Important provisions of the following Acts: - Labour Welfare Fund Act 1936 (as amended) - Payment of Wages Act 1936 (as amended) - Minimum Wages Act 1948 (as amended) - Acts relating to Labour Safety 6. Control of Progress: (05 Hours) 6.1 Methods of recording progress 6.2 Analysis of progress 6.3 Taking corrective actions keeping head office informed 6.4 Cost time optimization for simple jobs - Direct and indirect cost, variation with time, cost optimization	Upto-24-04-2024

3rd Sessional Exam 2024 7. Inspection and Quality Control: (09 Hours) 7.1 Need for inspection and quality control 7.2 Principles of inspection 7.3 Stages of inspection and quality control for - Earth work - Masonry - RCC - Sanitary and water supply services 8. Accidents and Safety in Construction: (08 Hours) 8.1 Accidents – causes and remedies 8.2 Safety measures for - Excavation work - Drilling and blasting - Hot bituminous works - Scaffolding, ladders, form work - Demolitions 8.3 Safety campaign and safety devices, safety training **ACCOUNTS** 9. Public Work Accounts: (22 Hours) 9.1 Introduction, technical sanction, allotment of funds, re-appropriation of funds bill, contractor ledger, measurement book running and final account bills complete, preparation of bill of quantities (BOQ), completion certificate & report, hand receipt, aquittance roll. Muster Roll labour, casual labour roll-duties and responsibility of different cadres, budget-stores, returns, account of stock, misc. P.W. advances T & P – verification, survey report, road metal material charged direct to works, account - expenditure & revenue head, remittance and deposit head, definition of cash, precaution in custody of cash book, imprest account, temporary advance, treasury challan, preparation of final bills. Students must learn to prepare accounts register. 9.2 Filling of PWD accounts forms	Upto-25-05-2024