SWAMI VIVEKANAND UNIVERSITY, SIRONJA, SAGAR (M.P.)

SYLLABUS

For
DIPLOMA IN CIVIL ENGINEERING

Course Code: DCE
Department of Civil Engineering
Faculty of Engineering

Duration of Course: 3 Year

Examination Mode: Semester

Examination System: Grading

Swami Vivekanand University, Sironja Sagar (M.P.)
2016-2017

Swami Vivekanand University, Sagar(M.P.)

Communication Skills (DCE-0101)

Paper Code	Title of the paper	Period Per Week				Distribution of Marks										Grand Total	Duration of Exam
		L	T	P	C	Theory			MST	Total	Practical		TW	Total			
						Max (a)	Min (b)	TW (c)	(d)	(d) = (a+c+d)	Max (e)	Min (f)	(g)	(h) = (e+f)	(i) = (d+h)		
DCE-0101	Communication Skills	3	1	-	4	70	22	10	20	100	-	-	-	-	100		03 Hrs

UNIT – I   Marks :14
COMMUNICATION PROCESS AND ITS NEEDS
How to make communication effective, Barriers in communication, Removal of barriers. Grammar and vocabulary for correct English usage. Determiners, Prepositions, Auxiliary verbs and subject- Verb agreement, Rewrite as directed (change voice, correct form of verbs/ tenses), Vocabulary – Oneword substitution, words often misused and wrongly spelt.

UNIT – II   Marks :14
PASSAGES OF COMPREHENSION
Prescribed passages (six from existing syllabus), Language of Science, Desalination or Desalting Process, Safety Practices, Non-conventional Sources of Energy, Our Environment, Entrepreneurship, Writing summary, moral and characterization of any one story from the book prescribed.

UNIT – III   Marks :14
BUSINESS COMMUNICATION
Principles of effective business correspondence Its parts, mechanics, styles and forms., Application for job, Bio-Data and C.V., Letter of Enquiry, Placing order, Complaint

UNIT – IV   Marks :14
COMPOSITION & TRANSLATION
Writing paragraphs of 150 words on topics of general interest i.e. pollution, ragging college, importance of computers, importance of communication skill, importance of science and technology etc., Translation (Hindi to English and vice- versa).

UNIT – V   Marks :14
UNSEEN PASSAGES & PRECIS WRITING
Answer the questions based on the passage. Give suitable title, Writing Précis.

Reference Books
1. English Conversation Practice, Grant Taylor.
2. Practical English Grammar, - Thomson & Martinet.
3. Communication Skills for Technical Students Book– I, Book – II, M/S Somaiya Publication, Bombay.
4. Living English Structure, S. Allen.
5. English Grammar, Usage, and Composition, Tickoo & Subramanian, S. Chand & Co. Standard Allen Longman.
6. Essentials of Business Communication, Dr. Rajendra Pal & J.S. Korlahalli S.Chand & Sons, New Delhi.
7. Effective Business Communication, M.V. Rodriques, Concept Pub. Co. New Delhi.
8. Communication for Business, Shirely Taylor, Longman, England.
9. Communication for Engineers and Professors, P. Prasad, S.K.Kataria and sons publications, New Delhi.
10. Technical English Book-II, Somaya Publications, New Delhi.

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Physics (DCE-0102)

Paper Code	Title of the paper	Period Per Week				Distribution of Marks										Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total			
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =		
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)		
DCE-0102	Physics	3	1	2	6	70	22	10	20	100	30	09	20	50	150		03 Hrs

UNIT – I   Marks :14

UNITS & MEASUREMENT: Fundamental and derived units, Scalar and vector, Basic requirements to represent vector, Symbols, abbreviation, and proculation, Linear measurement by vernier calipers, screw gauge and spherometer Angular measurement by angular vernier, MOTION: Motion and its type, Linear motion (laws and equation), Circular motion, Angular velocity and relation with linear velocity, Centripetal acceleration, Centripetal and Centrifugal forces Rotatory motion, Axis of rotation, Moment of Inertia, Radius of gyration, Kinetic energy of rotation, Numerical Problems and solution on the topic.

UNIT – II   Marks :14

MOLECULAR PHENOMENON OF SOLIDS, LIQUIDS AND GASES: Postulates Of Molecular Kinetic Theory of Structure of Matter, Brownian motion, Kinetic and Potential energy of molecules, Kinetic theory of gases, Postulates, Calculation of pressure by Kinetic theory, Prove of different gases law by Kinetic theory. **PROPERTIES OF MATTER**: Elasticity: Meaning, definition, stress, stain, Hook's law and elastic limit, Surface Tension : Meaning, definition, molecular forces, cohesive and adhesive forces, surface energy, capillary rise and capillary rise method.Viscosity : Meaning, definition, stream line and turbulent flow, critical velocity, Stock's law. Numerical problems and solution on the topic.

UNIT – III   Marks :14

HEAT: Heat and temperature, concept of heat as molecular motion, Transmission of heat, study state and variable state. Concept of heat capacity, specific heat and latent heat. Calorimeter and its uses, Thermodynamics , Relation between heat and work, Mechanical equivalent of heat, First law of thermodynamics and its application, Second law of thermodynamics and its application. Carnot cycle, Numerical problems and solution on the topic. Heating effect of current and thermoelectricity: Heating effect of electric current: Joule's law, work energy and power in electric circuit, calculation of electric energy. Thermo electricity, See back effect and thermoelectric power. Neutral temperature, emperature of inversion and relation between them, Thermo electric thermometer and thermo couples. Numerical problems and solution on the topic.

UNIT – IV   Marks :14

SOUND: Production of sound waves(Longitudinal and transverse waves), Progressive and stationary waves, Basic knowledge of refraction , reflection, interference and diffraction. Ultrasonic, Audible range, Production of ultrasonic, properties and uses, **OPTICS AND OPTICAL INSTRUMENTS**: Refraction, critical angle and total internal reflection, refraction, through lenses and problems, Power of lenses, Spherical and chromatic aberrations, Simple and compound microscope, telescope and derivation for their magnifying power, Numerical problems and solution on the topic.

UNIT – V   Marks :14

ELECTROSTATICS AND ELECTROMAGNETIC INDUCTION: Coulomb's law, Electric field intensity, potential. Capacity, principle of capacitor, types of capacitor, combination of capacitors, Electromagnetic Induction: Faraday's law, Lenz's law, Self and mutual inductance, Transformer and electric motor, Induction coil. **MODERN PHYSICS, BASIC ELECTRONICS**: Photoelectric effect, threshold frequency, Einstein- equation, Photo electric cells, Radioactivity : decay constant, Half life, mean life, Properties of nucleus, nuclear mass, mass defect, Production of x-rays, properties and its uses, Thermal emission, semiconductors, Types of semiconductors, Explanation of conductor, semiconductor and insulators on the basis of band theory, P-N junction, diode as rectifier.

Reference Books
1. Applied Physics Vol. 1 & 2, Saxena and Prabhakar.
2. Physics, - Ttti Publication.
3. Physics Vol. 1 &2, Halliday and Resnic R.
4. Engineering Physics, - Gaur and Gupta.
5. Principle of Physics, Brij Lal & Subramanyan.
6. Physics for Technical Education, LS Zednov.

List of Experiments
1. Refractive index of prism (I-d) curve
2. Refractive index of prism (spectrometer)
3. Focal length of a convex lens by u-v method
4. Focal length of a convex lens by displacement method
5. Verification of Ohm's law
6. To find out unknown resistance by meter bridge
7. To find out internal radius of hollow tube by vernier calipers.
8. To find out volume of given cylinder by screw gauge.
9. Surface tension by Capillary rise method.
10. Coefficient of viscosity
11. Coefficient of Thermal conductivity by searl's method.
12. Verification of Newton's cooling law.

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Chemistry (DCE-0103)

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total	Grand Total	
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0103	Chemistry	3	1	2	6	70	22	10	20	100	30	09	20	50	150	03 Hrs

UNIT – I   Marks :14

ATOMIC STRUCTURE AND RADIOACTIVITY : Discovery of electron, proton ,neutron and nucleus. Ruther ford's and Bohr's model of anatom. Bohr Burry scheme of filling the electrons in various orbits. Idea of s,p,d,f orbital.Alfa, Gamma and Beta rays, theory of radio activity, Group displacement law, half life period, numerical problems on half life period, fission and fusion.

SURFACE CHEMISTRY AND ITS APPLICATION: True solution, colloidal solution and suspension, lyophobic and lyophillic colloids, optical and electrical properties of colloids, coagulation, coagulants, idea about gels and emulsions.

ELECTROCHEMISTRY: Electrolysis, Faraday's laws of electrolysis, Numerical problems on Faradays Law, electroplating of copper and nickel.

COLLIGATIVE PRPOPERTIES: Osmosis & osmatic pressure, Relative vapour pressure and Routls law. Internal energy (enthalpy) Entrophy, Entrophy fusion free energy, Effect of change in temperature catalysis.

UNIT – II   Marks :14

CHEMICAL BONDING AND CATALYSIS: Bonding: Nature of bonds- Electrovalent, Co-valent, co-ordinate and hydrogen bond. Catalysis : Types , theory characteristic, positive , negative, auto and induced catalyst. Catalytic Promoter, and catalytic inhibitors. Industrial Application of catalysis.

WATER: Sources of water, types of water, hardness of water, its causes, types and removal, Boiler feed water, harmful - effects of hard water in boiler. Municipal water supply. Numerical on soda lime process. Determination of hardness of water by O. Hener's, EDTA and soap solution method.

UNIT – III   Marks :14

METALS AND ALLOYS : Physical and chemical properties of metals, copper, iron, aluminum, tin, nickel. General principal of metallurgy, minerals/ ores, ore dressing, roasting ,smelting, bassemerisation, fluxes, purification . Explanation of alloying purposes, methods of alloying, composition and uses of alloy like brass, bronze, duralium, German silver, gun metal, solder, stainless steel, casting and bearing alloy. Ionization, Ph value corrosion and protection: Arhenius theory of ionization, factors affecting ionization. pH meaning (numerical), Buffer solutions and Buffer actions, choice of indication (acidimetry and alkalimetry). Explanation of corrosion, types of corrosion, factors effecting corrosion, corrosion control (protection against corrosion), metal and organic coating for corrosion control.

UNIT – IV   Marks :14

GLASS, CEMENT AND REFRACTORY: Glass: Basic raw materials for glass, composition and manufacture of glass, varieties of glass and annealing of glass, Cement : Constituting compounds in cement, Composition of Portland Cement, its manufacture, setting and hardening of cement. Refractories : Meaning, characteristics , use of common refractory materials.

HIGH POLYMERS, RUBBER AND INSULATORS: Polymerization and condensation, classification of plastics, Compounding and Moulding constituents of plastics. Preparation Properties and uses of PVC, polyethene, polystyrene, polyamides, polyesters , Bakelite. Synthetic fibers - nylon, rayon, decron, and polyesters. Definition characteristics , classification and properties of insulators. Glass, wool and thermocole. Idea about rubber and vulcanization .

UNIT – V   Marks :14

LUBRICANTS, PAINTS AND VARNISHES: Lubricants: Meaning , type and theory of lubricants, properties of a good lubricants, Flash, and fire point and cloud point, emulsification number, viscosity. Paints and Varnishes : Meaning, ingredients and characteristics of good paints and varnishes, their engineering applications.

FUELS, FIRE EXTINGUISHERS AND EXPLOSIVES : Classification of fuel, gross and net calorific value, Determination of a solid fuel by bomb calorimeter , octane and octane number. Proximate analysis of fuel, its utility, crude petroleum, products of fractional distillation . Fire extinguishers - Description and use. Explosives - Meaning, types, characteristic and use of explosives. Name Dynamite, lead azide, T.N.T., Picric acid, R.D.X. Pollution and control: Introduction and chemical toxicology, air and water pollution, control of air and water pollution. Harmful effect of different gases like carbon mono-oxide, carbon dioxide, sulphur dioxide, nitric oxide, nitrous and lead.

Reference Books

1. Physical Chemistry, Bahl and Tuli
2. Inorganic Chemistry, Satyaprakash
3. Modern Text Book of Applied Chemistry, Dr. G. C. Saxena, Jain Prakashan, Indore
4. Applied Chemistry, Dr. G. C. Saxena, Deepak Prakashan, Gwalior
5. Applied Chemistry, Shrivastava & Singhal, Pbs Publication, Bhopal
6. Engineering Chemistry, Uppal
7. Engineering Chemistry, – Rao And Agarwal
8. Engineering Chemistry, P.C. Jain
9. Polymer Chemistry, O.P. Mishra
10. Applied Chemistry, H.N. Sahni, Deepak Prakash

List of Experiments

1. To identify one Anion and Cation in a given sample.
2. Determination of flesh point and fire point of a given sample of oil by Abel's apparatus.
3. Determination of viscosity by Red Wood Viscometer no. 1 and no.2.
4. Redoximetry Titration :
   a. Percentage of Iron in given sample of alloy.
   b. Determination of strength of ferrous ammonium sulphate.
   c. Determination of strength of anhydrous ferrous sulphate and ferrous sulphate.
5. Determination of hardness of water by :
   a. EDTA Method and Soap Solution Method
6. Determination of solid content in the given sample of water.
7. Determination of percentage of moisture in the given sample of coal by proximate analysis.

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Mathematics (DCE-0104)

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory				MST	Total	Practical		TW	Total	Grand Total	
		L	T	P	C	Max	Min	TW			(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0104	Mathematics	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT – I   Marks :14

ALGEBRA: Permutation- Meaning of factorial n, Permutation of 'n' dissimilar thing taken 'r' at a time. Combination Combination of n dissimilar things taken 'r' at a time, Binomial Theorem, Statement of the theorem for positive integer General Term, Middle term, Constant term, Partial Fractions, Define a proper-improper fraction, Break a fraction into partial fraction whose denominator contains Linear, Repeated linear and Non repeated quadratic factors. Determinant, Concept & principles of determinants, Properties of determinant, Simple examples. Complex Numbers, Algebra of Complex

UNIT – II   Marks :14

TRIGONOMETRY : Allied angles. Trigonometrical ratios of sum and difference of angles, (Only statement), Sum and difference of trigometric ratios (C-D formula), Multiple angles (Only double angle and half angle), Properties of triangle (without proof).
MATRIX : Definition of Matrix. Types of Matrix. Row, Column, Square, Unit, Upper and lower triangular, Symmetric & Skew Symmetric, Singular and non Singular Matrices. Adjoint of a Matrix. Inverse of a Matrix.

UNIT – III   Marks :14

CO-ORDINATE GEOMETRY : Co-ordinate System : Cartesian and Polar. Distance, Division, Area of a triangle. Locus of a point and its equation. Slope of St. Line, Angle between two St. lines. Parallel and perpendicular St. lines. Standard and general equation of St. line. Point of intersection of two st lines.
STATISTICS : Measures of Central tendency (Mean, Mode, Median), Measures of Dispersion (Mean deviation, standard deviation).

UNIT – IV   Marks :14

DIFFERENTIAL CALCULUS : Define constant, variable, function. Value of the function. Concept of limit of a function. Definition and concept of differential coefficient as a limit. Standard results. Derivatives of sum, difference, product, quotient of two functions. Diff coeff. of function of a function. Diff. coeff. of implicit function. Logarithmic Differentiation. Differential coeff. of Parametric function.

UNIT – V   Marks :14

INTEGRAL CALCULUS : Definition as a inverse process of differentiation, Standard Results (including inverse function), Methods of Integration, Substitution, Integration by parts, Breaking up into partial fraction, Concept of Definite Integral.
VECTOR ALGEBRA : Concept of Vector and Scalar Quantities. Different types of vectors. Addition and subtraction of vectors. Components of a vector, Multiplication of two vectors: Scalar Product, Vector Product, Applications (Work done, power & reactive power).

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Reference Books

1. Differential Calculus, Gorakh Prasad.
2. Integral Calculus, Gorakh Prasad.
3. Co-ordinate Geometry, S.L. Loni.
4. Engineering Mathematics, Dr. S.K. Chouksey & Manoj Singh.
5. Mathematical Statistics, Ray and Sharma.
6. Higher Engineering Mathematics, B.S. Grewal.

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Applied Mechanics (DCE-0201)

Paper Code	Title of the paper	Period Per Week				Distribution of Marks										Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total			
		L	T	P	C	Max (a)	Min (b)	TW (c)	(d)	(d) = (a+c)	Max (e)	Min (f)	(g)	(h) = (e+f)		(i) = (d+h)	
DCE-0201	Applied Mechanics	3	1	2	6	70	22	10	20	100	30	09	20	50		150	03 Hrs

UNIT – I   Marks :14
COMPOSITION AND RESOLUTION OF FORCES
Definition , Effect, characteristics of force,System of Forces,Principle of Transmissibility of Forces, Concept of Resultant Force,Law of –Parallelogram of Forces, Triangle of Forces, Polygon of Forces, Determination of Resultant of two or more concurrent forces (analytically andgraphically)
PARALLEL FORCES AND COUPLES
Classification of Parallel Forces, Methods of finding resultant Force of parallel forces- analytically & graphically,Position of resultant force of parallel forces- Definition, Classification and characteristics of a force Couple, moment of couple

UNIT – II   Marks :14
MOMENTS AND THEIR APPLICATIONS
Definition, Types and law of moment-Varignon's Principle of moment and its applications Lever and its Applications. Types of supports and determination of support reactions of a simply supported beam subjected to point load and uniformly distributed load (UDL).
EQUILIBRIUM OF FORCES
Equilibrium of a system of concurrent forces, Conditions and types of Equilibrium Lami's Theorem and its applications.

UNIT – III   Marks :14
CENTRE OF GRAVITY
Difference between Centroid and Center of Gravity (CG), Centroid of standard plane figures and CG of simple solid bodies, Method of finding out Centroid of composite plane laminas and cut sections, Method of finding out CG of Composite solid bodies.
FRICTION
Concept and types of friction, Limiting Friction, coefficient of friction, angle of friction, angle of repose, Laws of friction (Static and Kinetic), Analysis of equilibrium of Bodies resting on Horizontal and inclined Plane,Utility / Nuisance value of friction.

UNIT – IV   Marks :14
SIMPLE LIFTING MECHINES
Concept of lifting Machines, Definition of Mechanical Advantage, Velocity Ratio and Efficiency of Machines and their relation Reversibility of Machines and condition for self locking machine, Law of Machines, Maximum mechanical advantage and maximum efficiency of machine, Friction in machine (In terms of Load and effort), Calculation of M.A., V.R. and efficiency of following machines, Simple wheel and axle Differential wheel and axle Single purchase crab

Double purchase crab Simple screw jack, Different System of simple pulley blocks.

MOTION OF A PARTICLE

Definition of speed, velocity, acceleration, uniform velocity, uniform acceleration and variable acceleration, Motion under constant acceleration/ retardation (equations of motion) Motion under force of gravity, Concept of relative velocity, Definition of projectile, velocity of projection , angle of projection, time of light, maximum height, horizontal range and their determination, Definition of angular velocity, angular acceleration and angular displacement, Relation between linear and angular velocity of a particle moving in a circular path,Motion of rotation under constant angular acceleration.

UNIT – V   **Marks :14**

    LAWS OF MOTION

    Newton's Laws of motion and their applications.

    WORK, POWER AND ENERGY

    Definition unit and graphical representation of work, Definition and unit of power and types of engine power and efficiency of an engine. Definition and concept of Impulse, Definition, unit and types of energies, Total energy of a body falling under gravity.

Reference Books

1. A text book of Applied Mechanics – R.S. Khurmi , S.C. Chand & Co. , New Delhi
2. Applied Mechanics – I.B. Prasad, Khanna Publishers, New Delhi
3. Applied Mechanics (Hindi) – R.S. Jog, Anand Publishers, Gwalior Applied

List of Experiments

1. Verification of laws of parallelogram of forces.
2. Verification of laws of polygon of forces
3. Verification of laws of moments
4. Determination of forces in the members of Jib Crane
5. Determination of Centroid of plane lemina by graphical method
6. Determination of coefficient of friction for surfaces of different materials on horizontal plane
7. Determination of coefficient of friction for surfaces of different materials on an inclined plane Determination of mechanical advantage, velocity ration and efficiency of the following lifting machines.
8. Simple wheel and axle Differential wheel axle Single purchase crab Double purchase crab Simple pulley block Simple screw jack
9. Measurement of B.H.P. of an engine using roap break dynamometer

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Environmental Engineering and Safety (DCE-0202)

Paper Code	Title of the paper	Period Per Week				Distribution of Marks										Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total			
		L	T	P	C	Max (a)	Min (b)	TW (c)	(d)	(d) = (a+c)	Max (e)	Min (f)	(g)	(h) = (e+f)		(i) = (d+h)	
DCE-0202	Environmental Engineering and Safety	3	1	-	4	70	22	10	20	100	-	-	-	-		100	03 Hrs

UNIT – I   Marks :14

INTRODUCTION TO ENVIRONMENT.
The Biosphere, biotic and abiotic, An aquatic ecosystem, Types of pollution, Impact of human being on environment, Impact of environment on human being, Basic approach to improve environmental qualities, Roll of an environmental engineer.

AIR POLLUTION SOURCES AND EFFECTS.
Standard definition of air pollution, Composition of natural air, Names of air pollutants, Classification of air pollutants, primary and secondary pollutants, Classification of source of air pollutants on different bases, Definition of different types of aerosols, Effect of air pollution on: human health, material properties, vegetation, Major toxic metals and their effects, Major environmental phenomenon e.g., acid rain, global warming, green house effect, ozone layer depletion, Air quality standards, Brief description of air pollution laws.

UNIT – II   Marks :14

METEOROLOGICAL ASPECTS OF AIR POLLUTANT DISPERSION.
Meteorological parameters influencing air pollution, Environmental laps rate, temperature inversion, atmospheric stability and adiabatic loss rate, Turbulence, topographical effects, Plume behavior, looping, coning, fanning fumigation, lofting , trapping.

AIR POLLUTION CONTROL METHODS AND EQUIPMENTS.
Natural purification processes of air,Artificial purification methods of air, Brief description of following control equipments along with sketch e.g, gravitation settling chamber, cyclone, scrubber, bag house filter, electrostatic precipitator, Brief description of following processes for the control of gaseous pollutants e. g., absorption, adsorption, condensation, combustion etc.

UNIT – III   Marks :14

WATER POLLUTION SOURCES AND CLASSIFICATION.
Water resources, Uses of water, Classification of water,Origin, composition and characteristics of domestic waste water as well as industrial waste water, Biochemical oxygen demand, Water pollution laws and standards, Uses of waste water,Classification of waste water, Chemical oxygen demand.

WASTE WATER TREATMENT METHOD.
basic processes of water treatment. Meaning of primary, secondary and tertiary treatment.Flow chart of a simple effluent treatment plant, Theory of indusrial waste treatment,Volume reduction, neutralization and proportioning.

UNIT – IV   Marks :14

SOLID WASTE MANAGEMENT.
Sources and classification of solid waste, Public health aspects, Disposal methods – open dumping , sanitary , land fill. Incineration , compositing, Potential methods of disposal, Recovery and recycling of paper, glass, metal and plastic.

NOISE POLLUTION AND CONTROL.
Sources of noise pollution, Units of Noise pollution measurement, Allowable limits for different areas, Problems of noise pollution and measures to control it, Noise pollution control devices brief discussion.

UNIT – V   Marks :14

SAFETY PRACTICES
Responsibility of employees and employers regarding health and safety, Fire hazards ,prevention and precautions, Industrial hazards prevention and protection, Protection from air and noise pollution.

Reference Books
1.   Environmental pollution control Engineering by C.S. Rao.
2.   Air pollution and control by Seth.
3.   Air pollution by M.N Rao.

List of Experiments
GROUP A AIR POLLUTION (Any one experiment may be selected from this group)
1.   Air monitoring and determination of SPM , CO, Nox, SO2 with high volume sampler.
2.   Monitoring of stack gases and determination of SPM , CO, Nox, SO2 with slack monitoring kit.
GROUP B NOISE POLLUTION
3.   Determination of sound pollution in (a) Auditorium (b) Factories (c) Busy roads (d) Theatre (e) TV rooms (select any three situations)
GROUP C INDUSTRIAL WASTE WATER (Any Two experiment may be selected from this group)
4.   Determination of BOD/COD ratio in industrial waste water.
5.   Determination of Ph and alkanity/ acidity in industrial waste water.
6.   Determination of solids in industrial
GROUP D POLLUTION STANDARDS(Any Two experiment may be selected from this group)
7.   Study of drinking water standards.
8.   Study of effluent standards for water disposal.
9.   Study of air pollution standards.

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Introduction to Computers (DCE-0203)

Paper Code	Title of the paper	Period Per Week				Distribution of Marks										Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total			
		L	T	P	C	Max (a)	Min (b)	TW (c)	(d)	(d) = (a+c)	Max (e)	Min (f)	(g)	(h) = (e+f)	(i) = (d+h)		
DCE-0203	Introduction to Computers	3	1	2	6	70	22	10	20	100	30	09	20	50	150		03 Hrs

UNIT – I   Marks :14
INTRODUCTIONTO COMPUTERS
Basic Concepts-Generations of Computers Overview of computer Systems Classifications of Computers Characteristics of Computes Applications of Computers. Numbers System & Codes-Decimal, Binary, Octal, Hexadecimal Conversions from one system to other Binary Coded Decimal & ASCII Code. Computer Hardware: Input Devices-Keyboard, Mouse, Trackball, Joystick, Scanner, OMR OCR Bar-Code Reader, MICR, Digitizer, Card Reader, Voice Recognition, Web Cam, Video Cameras, Etc. Output Devices-Monitors, Printers : Dot matrix, Inkjet & Laser, Plotters, Commuter, Output Micro Film (COM), Multimedia Projector, Speech Synthesizsr, Dumb, Smart & Intelligent Terminal.Storage Devices

UNIT – II   Marks :14
Primary and Secondary Storage- Characteristics and Limitation, Floppy, Hard disk, CD ROM DVD, Disk Cartridge. Microprocessor-Registers, Arithmetic Unit, Control Unit, Buses, Instruction Set, Processor Speed.,Memory Concepts. Concept of Memory-Unit of Memory, Types of Memory, RAM,ROM, PROM, EPROM, EEPROM, Cache Memory. Computer Software-System Software Vs Application Software, Operating System Programs, Language Processor, Assembler, Compiler & Interpreter,Application Software, Types of Application Software and their examples., High Level Language, Low Level Language, Assembly Language. Multimedia-Basics of Multimedia,Components- Text, Graphics, Animation, Audio, Images & Video. Multimedia Applications.

UNIT – III   Marks :14
OPERATING SYSTEM
Overview of DOS- Internal Commands, External Commands. Windows Operating System-Overview of different versions of Windows Characteristics and Facilities of Windows, Terminologies of Windows – Desktop, Icon, Menu etc. Components of Desktop. Working with Files and Folders. Windows Utilities and Accessories – Notepad, WordPad, Paintbrush, Windows Explorer, Calculator. Introduction to Linux- An overview of Linux, Basic Linux elements System, Features Software, Features File structure, Linux H/W & S/W requirements.

UNIT – IV   Marks :14
WORD PROCESSING
Saving, Closing, Opening of documents, Selecting text Editing text, Finding and replacing text\ Printing documents, Merge Documents. Character and paragraph Formatting, Page Design and layout. Spell Check, Creating Tables and Charts. Handling Graphics

SPREADSHEET PACKAGE

Spreadsheet concept – Need, advantage, Terminology like cell, row, column etc. Working with Spreadsheet– Creating, Saving, Editing and printing, Entering data – Entering number, text, date, time etc. Selecting cells – Cut, copy, paste date, Editing Worksheet data. Formatting – Text and Cells, Applying border shading, background patterns, conditional formats, positioning cells, formatting numbers, text, Date, time. Creating formulas- Entering, Editing, Using Functions, Controlling calculations. Working with Charts- Creating charts, Adding & changing text, changing the view and display, types of charts. Presentation Software: Introduction Presentation design tools Presentation terminologies, Creating, Opening and Saving Presentation. Working with different views Creating and Organizing slides, Adding and Formatting text in slides Formatting paragraphsm Adding drawings and objects Creating special effects Working with table and charts Printing Presentation.

UNIT – V   Marks :14

DATABASE

Introduction – need, Characteristics and terminologies of database, Types of database – relational, Hierarchical and Network. Basic entities – Tables, records, Data types, Data, Validation and constraints, keys relation between tables. Query – Select, Insert, Update, Delete. Forms – Creating forms, Forms controls Report Designer- Customize formats, grouping reports. Computer Communication & Networks: Information Networks- The Technology of Workgroup Computing, Types of network, Network topology.Network components. Data Communication-Introduction to Data Communication,Types of Data,Transmission media. Internet and E-mail- Internet Basics, Websites- Applications, terminologies, naming conventions., Web Browsers- Types, Navigation and tools, E-mail – concept, terminologies, mailing services provider, advantages comparison with Conventional mailing. Search engine – concept, search engine websites, searching methods.

Text Books
1. S . Jaiswal, A First Course in Computers, Golgotha Publication
2. Slotnick, Butterfield, Colantonio and Kopetzky, Computers & Application, C.C. Health & Company
3. Ron Mansfield, The Complete Guide to Microsoft Office Professional, Sybex /BPB Asian Edition
4. Hardware Bible, BPB Publication
5. Learning Windows in 24 Hours, Sam Techmedia

Reference Books
1. Suresh K. Basandra, Computers Today, Galgotia Publication
2. Norton Peter, Inside IBM PC
3. Computer Hardware, Osborne Series
4. Hardware Bible, BPB Publication
5. Learning Windows in 24 Hours, Sam Techmedia
6. Chapman, Understanding windows, BPB Publication

List of Experiments

1. Study of various components of computer like CPU, keyboard, mouse, monitor, printer, CVT and storage devices.
2. Internal and external commands of DOS.
3. Using Windows operating system, study of desktop, control panel, accessories and settings.
4. File management in windows explorer, Study of WordPad, NotePad, PaintBrush, Calculator etc. Study of Linux operating system.
5. Study of MS-word – opening and saving of documents, formatting, editing and spell check, find and replace, printing, merging. Creating Table, Charts and Graphics.
6. Study of Spreadsheet – creating, saving, editing and printing. Entering data, selecting cells, formatting text, applying border shades and backgrounds, creating formulas, creating charts.
7. Study of Power Point – creating, opening, editing and saving of slides. Adding and formatting text, creating, animations, working with images and special effects. Printing presentation.
8. Study of MSAcess– creating, saving, editing and printing of tables. Managing relationships, writing queries e.g. SELECT, UPDATE, DELETE, INSERT. Forms designing and report printing.
9. Study ofWeb Browser and mailing programs.

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Engineering Drawing (DCE-0204)

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total		
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0204	Engineering Drawing	3	1	2	6	70	22	10	20	100	30	09	20	50	150	03 Hrs

UNIT – I   Marks :14

INTRODUCTION TO DRAWING INSTRUMENTS:
Introduction of drawing instruments, materials and their uses, Applications of minidrafter Applications of compass and divider Applications of French curves and spline Pencils grades and their uses, Designation and sizes of drawing sheet and drawing board.

PLANNING AND LAYOUT OF DRAWING SHEET:
Planning of drawing sheet as per I.S.: 696-1972 (SP 46: 1988). This should include- Margin, Title Block, Zoning, Revision panel, Folding marks, Numbering of sheet.

CONVENTIONAL REPRESENTATION:
Conventional representation of the following as per BIS practice.Common Engineering materials Electrical installations and fittings – Main switches, (lighting and power), socket outlets (3 pin 5AMP, 3pin15AMP), bell, buzzer, loud speaker, Aerial, ceiling fan, exhaust fan, Bracket fan, fan regulator, battery and earth point.
Electronics components- Diode: Zener, varactor, Scotty, step recovery, light emitting diode (LED), PNP and NPN transistors, résistance, capacitor, Inductors (fixed and variable both), IC (8pin and 14pin), SCR, TRIAC, DIAC, UJT, FET, MOSFET, LOGIC GATES.
Sanitary fittings- showerhead, wall lavatory basin, corner Lavatory basin, urinal stall, kitchen sink, Indian type WC, Water closets (Asian pan, urissapan, Anglo-Indian, European)
Building -single and double swing doors and windows.
Mechanical components- Internal and external threads, slotted head, Square end and flat, radial arms and ribs, serrated shaft, splined shaft, Chain wheel, bearing, straight and diamond knurling, Compression and tension spring, leaf spring (with and without eye), Spur and helical gear.

LINES, LETTERING AND DIMENSIONING:
Introduction of type of lines and their applications, Single stroke vertical, inclined letters (capital and lowercase) And numerals. Dimensioning: Elements of dimensioning- dimension line, extension line, arrowhead And leader line. Dimensioning system – Aligned and unidirectional. Dimensioning of Arcs and Circles. Angular Dimensioning.Dimension of counter sunk and counter bore.

UNIT – II   Marks :14

GEOMETRICAL CONSTRUCTIONS AND ENGINEERING CURVES
Divide a line into any number of equal parts by parallel line method, Bisecting of line and angle. Construction of triangles and polygons Introduction of conic sections (curves), Construction of Ellipse by Eccentricity and Concentric circles methods, Construction of Parabola by Eccentricity

and Rectangle methods, Construction of Hyperbola by Eccentricity method, Construction of Cycloid, Construction of Involutes of circle and polygon, Construction of Archemedian Spiral of any number of convolutions.

SCALES:

Introduction of scales and their applications, Concept of reducing, enlarging and full size scale Classification of scales – plain, diagonal, vernier, Scale of chord and comparative scales Definition of R.F. Construction of plain and diagonal scales.

UNIT – III   Marks :14

THEORY OF PROJECTION AND PROJECTION OF POINTS, LINES AND PLANES

Definition of various term associated with theory of projection- Planes of projection, Quadrants, first & third angle projection method, Projection of points in all the four quadrants. Projection of linesparallel to HP and VP both, perpendicular to one plane and parallel to other, Inclined to one plane and parallel to other, knowledge of projection of line inclined to both the plane, (No practice required).

Projection of planes – Perpendicular to HP and VP both, Perpendicular to one plane and parallel to other, Inclined to one plane and perpendicular to other, Knowledge of projection of plane inclined to both the planes.

UNIT – IV   Marks :14

PROJECTIONS OF SOLIDS:

Projection of cylinder, cone, prism and pyramid. Under the conditions :- Axis parallel to HP and VP, Axis perpendicular to HP and parallel to VP, Axis perpendicular to VP and parallel to HP, Axis inclined to HP and parallel to VP, Axis inclined to VP and parallel to HP, Axis inclined to both HP and VP.

SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES:

Section of cone, cylinder, prism and pyramid (Solid resting on its base in the HP i.e. the Axis perpendicular to HP and parallel to VP) in the cases:- Section plane parallel to HP and perpendicular to VP, Section plane parallel to VP and perpendicular to HP, Section plane inclined to HP and perpendicular to VP, Section plane inclined to VP and perpendicular to HP. Drawing True shape of section.

Introduction to development of lateral surface of solids- Cone, Cylinder, Prism and Pyramids (Simple and truncated). Under the condition – solid resting on its base in the HP and axis Perpendicular to HP and parallel to VP. Development of funnel and elbow.

INTERSECTION OF SURFACES

Intersection of following cases – Cylinder to cylinder and Prism to prism (With their axis intersecting and perpendicular to each other.)

UNIT – V   Marks :14

ORTHOGRAPHIC PROJECTIONS & FREE HAND SKETCHING:

Principles of orthographic projections- Identification of necessary views and superfluous view Selection of front view. Preparation of necessary orthographic views of simple objects From given pictorial views. Dimensioning of orthographic views as per standard practice. Free hand sketches of simple objects (Using Pencil, Eraser & Paper only)

ISOMETRIC VIEWS

Concept of isometric projection and isometric view (Isometric Drawing), Construction of isometric scale, Construction of isometric view of polygon and circle, Construction of isometric view of cone, cylinder, prism and pyramids, Construction of isometric view of simple objects from given orthographic views.

Text Books

1. ENGINEERING DRAWING – N.D. Bhatt
2. ENGINEERING DRAWING – R.K. Dhawan
3. ENGINEERING DRAWING – P.S.Gill

Reference Books

1. ENGINEERING DRAWING – P.S.Gill
2. SP: 46-1988 Bureau of Indian standard
3. PRINCIPLES OF ELECTRONICS – Malvino

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Workshop Practice (DCE-0205)

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total		
		L	T	P	C	Max (a)	Min (b)	TW (c)	(d)	(d) = (a+c)	Max (e)	Min (f)	(g)	(h) = (e+f)	(i) = (d+h)	
DCE-0205	Workshop Practice	-	-	4	4	-	-	-	-	-	60	18	40	100	100	03 Hrs

PURPOSE
To provide the students with hands on experience on different trades of engineering like fitting, carpentary, smithy, welding and sheet metal.

INSTRUCTIONAL OBJECTIVES
To familiarize with
1. The basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
2. The production of simple models in the above trades.

Text Books
1. Gopal, T.V., Kumar, T., and Murali, G., A first course on workshop practice – Theory, practice and work book, Suma Publications, 2005.

Reference Books
1. Kannaiah,P. & Narayanan,K.C. Manual on Workshop Practice, Scitech Publications, Chennai, 1999.
2. Venkatachalapathy, V.S. , First year Engineering Workshop Practice, Ramalinga Publications, Madurai, 1999.

List of Experiments
1. EMPHASIS TO BE LAID ON REAL LIFE APPLICATIONS WHEN FRAMING THE EXERCISES.
2. FITTING
   Tools & Equipments – Practice in Filing and Drilling.
   Making Vee Joints, Square, dovetail joints, Key Making.
3. CARPENTARY
   Tools and Equipments- Planning practice. Making Half Lap, dovetail, Mortise & Tenon joints, a mini model of a single door window frame.
4. SHEET METAL
   Tools and equipments - Fabrication of a small cabinet, Rectangular Hopper, etc.
5. WELDING
   Tools and equipments - Arc welding of butt joint, Lap Joint, Tee Fillet.
   Demonstration of Gas welding, TIG & MIG.
6. SMITHY Tools and Equipments –Making simple parts like hexagonal headed bolt, chisel.

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DCE-0301 SURVEYING -1

Paper Code	Title of the paper	Period Per Week				Distribution of Marks										Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total			
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =		
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)		
DCE-0301	SURVEYING-I	3	1	2	6	70	22	10	20	100	30	09	20	50	150		03 Hrs

UNIT- I   Marks : 14
Introduction
Concept of surveying, purpose of surveying, Measurements: linear and angular, units of measurement, instruments used for taking these measurements. Classification of survey based on instruments. Basic principles of surveying. Chain Surveying Purpose of chain surveying, Principles of chain surveying, Equipment used in chain surveying, Viz. Chains, tapes, ranging rods, arrows, pegs, cross staffs, Indian optical square their construction and uses, Different operations in chain surveying: Ranging (direct/indirect), Offset (perpendicular/oblique) Chaining (flat and sloping ground) Conducting chain survey over an area Recording the field data, plotting the chain survey, conventional sign .obstacles in chain surveying, Errors in chain surveying, Correction for erroneous length of chain, simple problems. Testing and adjustment chain, Compass Surveying- I

UNIT- II   Marks : 14
Purpose of compass surveying,Construction and working of prismatic compass.use of prismatic Compass, Method of setting and taking observations. Concept of following: (a) Meridian - Magnetic, true and arbitrary, (b) Bearing - Magnetic, True and Arbitrary, (c) Whole circle Bearing and Reduced Bearing, (d) Fore and back bearing.

UNIT- III   Marks : 14
Compass Surveying- II
Local attraction - causes detection, errors and correction. Problems on local attraction, magnetic, declination and calculation of included angles in a compass traverse. Concept of a traverse -Open and closed traverse. Traversing with a prismatic compass Checks for an open and closed, traverse. Plotting of a traverse -by included and deflection angles. Concept of closing error,Adjustment of traverse graphically.errors in compass surveying. Testing and adjustment of a,prismatic compass. Use of surveyor's compass and its construction details, comparison with prismatic compass, Leveling- I.

UNIT- IV   Marks : 14
Purpose of leveling, concept of a level surface, horizontal surface, vertical surface, datum, reduced level and bench marks, principle and construction of dumpy and I.O.P. (Tilting) levels, Concepts of line of collimation, axis of the bubble tube, axis of the telescope and vertical axis, Leveling staff. (i) single piece (ii) Folding (iii) sop with pattern.(iv) Invar precision staff., Temporary adjustment: setting up and leveling, adjusting for parallax of Dumpy and I.O.P. level.

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UNIT- V   **Marks : 14**
Leveling- II
Differential leveling concept of back sight, fore sight, intermediate sight station,change point, height of instrument. Level book and reduction of levels by (a) Height of collimation method and (b) Rise and fall method. Arithmetic checks. Problem on reduction of levels Fly leveling, check Leveling and profile leveling (L-section and X-section) Errors in leveling, and precautions to minimize them and permissible limits. Reciprocal leveling. Difficulties in leveling Concept of curvature and refraction,testing and adjustment of dumpy and I.O.P. level. Numerical problems.

Text Books

1. Arora K.R. *Surveying Vol. I & II,*Standard Book House, Delhi.

2. Kanetkar T.P., *Surveying & Levelling Vol. I & II,* Pune Vidyarthi Griha Prakashan, Pune.

3. Basak P.N., *Surveying & Leveling,* Tata Mc Graw - Hill Publishing Co. Ltd., Delhi.

4. Agarwal G.D., *Surveying Vol. I & II,* Unitech Publishers, Lucknow.

5. Dass G., *Surveying Vol. I & II,* Nav Bharat Prakashan, Meerut.

Reference Books

1. Punmia B.C., *Surveying Vol. I & II,* Laxmi Publications (P) Ltd. New Delhi.

2. Guggal S.K., *Surveying Vol. I & II,* New Age International Publishers New Delhi.

Chandra A.M., Surveying Problem Solving with Theory & Objective Type Questions, *New Age International Publishers New Delhi.*

List Of Experiments:

(i) (a) Ranging a line.

 (c) Chaining a line and recording in the field book.

(d) Testing and adjustment of chain.

(ii) (a) Chaining of a line involving reciprocal ranging

(b) Taking offsets and setting out right angels with cross staff and Indian optical square.

(iii) Chain survey of a small area. Plate -I

(iv) Chaining a line involving obstacles in ranging. Compass survey

(v) (a) Setting the compass and taking observations .

(b) Measuring angle between the lines meeting at a point by prismatic compass.

(vi) Traversing with the prismatic compass and chain of a closed traverse. (Recording and plotting by included angles).

Plate -II

(vii) Traversing with the prismatic compass and chain of a closed and open traverse. (Recording and plotting by deflection angles).

Plate III

(viii) Determination of local traction at a station by taking fore and back bearing.

(ix) To find true bearing of a line at a place.

Leveling:

(x) To find difference of level between two distant points by taking staff reading on different stations from the single setting.

(xi) To find difference of level between two points by taking at least four change points .

(xii) Longitudinal sectioning of a road. Plate IV

(xiii) Cross- sectioning of a road. Plate V

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

DCE-0302 MATERIAL TECHNOLOGY

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total		
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0302	MATERIAL TECHNOLOGY	3	1	-	4	70	22	10	20	100	-	-	-	-	100	03 Hrs

UNIT-I   Marks : 14

INTRODUCTION :
Importance of material Technology for Civil Engineer. name of common Engineering materials used in construction

MASONARY MATERIALS : a) Building stones- classification of rocks, requirement of good building stone, dressing of stones, quarrying of stones, artificial or cast stones b) Bricks properties of good building bricks,conventional bricks,standard bricks,composition of clay brick,method of preparation of bricks, strength of bricks, proportions of burnt clay bricks,testing of bricks, special bricks, hollow blocks, fly ash bricks.

UNIT-II   Marks : 14

AGGREGATES: Properties of fine aggregates - Concept of size, shape,surface texture, strength, specific gravity, bulk density , water absorption,surface moisture, soundness, bulking impurities. Determination of fineness modulus & grading zone of sand by sieve analysis, determination of silt content in sand & their specification as per IS 383, Bulking of sand, phenomenon of bulking, its effect on concrete mix proportion. Properties of coarse aggregates - Concept of size, shape, surface texture, water absorption, soundness, specific gravity& bulk density, Determination of fineness modulus of coarse aggregate by sieve analysis, grading of Coarse Aggregates. Determination of crushing value, impact value & abrasion value of coarse aggregate, flakiness index & elongation index of coarse aggregate and their specification.

MORTARS: Classifications, lime mortar, cement mortar, special mortars.

Functions of mortar, proportions, properties of mortar and tests for mortar.

UNIT-III   Marks : 14

CONCRETE: Introduction to concrete - Definition of concrete, necessity of supervision for concreting operation, different grades of concrete (as per provisions of IS 456- 2000), minimum grade of concrete for different exposure conditions, minimum grade of concrete for R.C.C., water retaining structure & in sea water construction, durability of concrete. Water cement (w/c) ratio, Definition of w/c ratio, significance of w/c ratio, maximum w/c ratio for different grades of concrete for different exposure conditions. Properties of fresh concrete, Definition of workability ,factors affecting workability of concrete.

Determination of workability of concrete by slump cone test, compaction factor test, vee bee consistometer Range values of workability requirement for different types of concrete works, cohesiveness, segregation, bleeding, creep of concrete. Curing of concrete. Testing of concrete for strength and workability. Properties of hardened concrete

UNIT-IV

PAINTS, VARNISHES & COLOURS : Different in gradients used in manufacturing/ preparation of paints, Primers, their different types for steel and timber. Use of paint as protecting surface device for steel surface type of paint used and for wood surface types of paint used. varnish Method of preparation of varnish, component materials used in varnish.

COLOURS: For decorative purpose and finished purpose use of color as water base, color as oil base, Distempers and cement paints

UNIT-V   Marks : 14

MISCELLANEOUS: Give the concepts about the other materials which can be used as Engineering Materials like Glass, Rubber, Tar, Emulsion, Bitumen, Glass wool, Use of J bolts, U hooks, Stoneware pipes, Galvanized iron pipes. Miscellaneous materials: glass, plastic- P.V.C. pipes used as materials in pipe laying for water supply purposes, Irrigation etc. Water tanks. fibers, aluminum, steel , galvanized iron, asphalt bitumen etc. micro silica, PVC, CPVC, PPF. Waterproofing and termite proofing materials, admixtures in concrete, bonding agents, epoxy resins, Polishing materials etc. readymade concrete cover. Readymade ornamental material (wall papers, carpets, radium prints, blocks etc.)

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DCE-0303 BUILDING CONSTRUCTION

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total		
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0303	BUILDING CONSTRUCTION	3	1	-	4	70	22	10	20	100	-	-	-	-	100	03 Hrs

UNIT- I   Marks : 14

Introduction: Definition of a building, classification of building based on occupancy. Different parts of a building. Orientation of buildings. Site selection. Exposure to building bylaws/master plan and building approval Walls Purpose of walls: Classification of walls - Load Bearing and Non Load Bearing, Dwarf wall. Classification of walls as per materials of construction, brick, stone, reinforced brick, reinforced concrete, precast hollow and solid concrete block and composite masonry wall Brick masonry - Definition of terms; mortar, bond, facing, backing, hearting, column, pillar, jambs, reveals, soffit, plinth, plinth masonry, Brick: header, stretcher, bed of brick, bat, queen closer, king closer, frog and quoin.

UNIT- II   Marks : 14

Bond - Meaning and necessity: Types of bond and their suitability (English, Flemish, Header and Stretcher) 1, 1-1/2 and 2 Brick thick walls in English Bond. T and right angled corner junctions. Sketches for 1, 1-1/2 and 2 brick square pillars in English Bond, Construction of Brick walls - Method of laying bricks in walls, precautions observed in the Construction of walls, Method of bonding new brick work with old (Toothing, raking back and block bonding). Construction and Expansion Joints.

UNIT- III   Marks : 14
Stone Masonry

(a) Glossary of terms - Natural bed of a surface, bedding planes, string course, corbel, cornice, block - in course, grouting, moldings, templates, throttling, through stones, parapet and coping.
(b) Types of Stone Masonry: Rubble Masonry; random and coursed, Ashlar Masonry Ashar
fine, Ashlar rough tooled Ashler facing, specifications for coursed rubble masonry, principles to be observed in construction of stone masonry walls. Partition walls: Constructional details, suitability and uses of brick and wooden partition walls.

UNIT- IV   Marks : 14

Mortars - preparation, use and average strength of cement, lime, lime cement, lime surkhi and mud mortar. Scaffolding: Constructional details and suitability of mason's Brick Layers and Tubular scaffolding. Shoring & under pinning: Types and uses. Safety in construction of low rise and high rise buildings. Arches and Lintels: Meaning and use of Arches and Lintels. Glossary of terms used in Arches and Lintels - Abutment, Pier, Arch ring, Intrados, Soffit Extrados, Voussoiers, Springer, Springing line, Crown, Key stone, Skew back, Span, Rise, Depth of an Arch, Haunch, Spandrel, Jambs, Bearing thickness of lintel, effective span. Arches: Brick arches and their construction.

UNIT- V   **Marks : 14**

Doors and Windows

Glossary of terms, used in Doors and windows, Doors - Name; uses and sketches of Metal doors; Ledged and Battened Doors; Framed and Paneled doors, glazed and paneled doors, flush doors, collapsible doors, Rolling steel shutters side sliding doors, Door frames, PVC shutters & metal doors. Windows - Name, uses and sketches of metal windows, fully paneled windows, fully glazed windows, casement windows, fanlight windows and ventilators, sky light window frames, Louvered shutters (emphasis shall be given
for using metals, plastics etc. in place of timber).

Text Books

1. Kumar Susheel, *Building Construction,* Standard Publishers Distributers, Delhi.

2. Singh Gurcharn, *Building Construction,* Standard Publishers, Delhi.

3. Gupta D.V., *Building Construction,* Asian Publishers, Muzaffarnagar.

Reference Books

1. Punmia B.C., *Building Construction.*

List of Practical's :

1. To conduct field tests of cement.
2. To determine normal consistency of cement.
3. To determine setting time (initial and final) of cement.
4. To determine fineness of given sample of cement.
5. To determine compressive strength of bricks.
6. To determine water absorption of bricks
7. determine soundness of cement.
8. To Layout of a building.

9. To construct brick bonds (English and Flemish bonds) in one, one and half and two brick thick

(a) walls. L, T and cross junction. (b) Column.

10. Visit to construction site for showing the following item of works and to write
specific report about the works seen.
(a) Timbering of excavated Trenching.
(b) Construction of Masonry Walls.
(c) Flooring: Laying of flooring on an already prepared lime concrete base.
(d) Plastering and Pointing of wall.
(e) White & colour washing.
(f) Use of Special type of shuttering/cranes/heavy machines in construction work.

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DCE-0304 HYDRAULICS AND HYDRAULIC MACHINE

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total	Grand Total	
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0304	HYDRAULICS AND HYDRAULIC MACHINE	3	1	2	6	70	22	10	20	100	30	09	20	50	150	03 Hrs

UNIT- I   Marks : 14
Properties of Fluids: Fluids : Real fluid, ideal fluid., Fluid Mechanics, Hydraulics, Hydrostatics, Hydro kinematics., Mass density, specific weight, specific gravity, cohesion, adhesion, viscosity, surface tension, capillarity, vapor pressure and compressibility. Hydrostatic Pressure, Pressure, intensity of pressure, pressure head, Pascal's law and its applications. Total pressure, resultant pressure, and centre of pressure. Total pressure and centre of pressure on vertical and inclined plane surfaces: Rectangular, Triangular, Circular.

UNIT- II   Marks : 14
Measurement of Pressure: Atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure. Use of simple manometer, differential manometer and mechanical gauges, Measurement of pressure by manometers and pressure gauges. Fundamental of Fluid Flow, Types of Flow, Steady and unsteady flow, Laminar and turbulent flow Uniform and non-uniform flow. Discharge and continuity equation (flow equation) Types of hydraulic energy. Potential energy, Kinetic energy, Pressure energy Bernoulli's theorem; statement and description (without proof of theorems). Venturimeter (horizontal and inclined)

UNIT- III   Marks : 14
Orifice: Definition of Orifice, and types of Orifices, Hydraulic Coefficients. Large vertical orifices. Free, drowned and partially drowned orifice. Time of emptying a rectangular/circular tanks with flat bottom. Flow through Pipes: Definition, laminar and turbulent flow explained through Reynolds's Experiment. Reynolds Number, critical velocity and velocity distribution. Head Losses in pipe lines due to friction, sudden expansion and sudden contraction entrance, exit, obstruction and change of direction (No derivation of formula). Hydraulic gradient line and total energy line.

UNIT- IV   Marks : 14
Flow through open channels: Definition of a channel, uniform flow and open channel flow. Discharge through channels using. (i) Chezy's formula (no derivation) (ii) Manning's formula Most economical sections: (i) Rectangular (ii) Trapezoidal Flow Measurements: Measurement of velocity by Pitot tube , Measurement of Discharge by a Notch, Difference between notches and orifices. Discharge formulae for rectangular notch, triangular Notch, trapezoidal notch, and conditions for their use. (with derivation) Measurement of discharge by weirs. Difference between notch, weir and barrage. Discharge formula for free, drowned, and broad crested weir with and without end contractions; velocity of approach and condition of their use.

UNIT- V   **Marks : 14**

HYDRAULIC MACHINE

Reciprocating pumps, Centrifugal pumps, Impulse Turbines, Reaction Turbines, Sketching and description of principles of working of above mentioned machines.

Text Books

1. Fluid Mechanics & Hydraulic Machines

2. Vijay Gupta & Gupta S.K., Fluid Mech Delhi.

3. Kapoor J.K., Hydraulics, Bharat Bharti

4. Likhi S.K., Hydraulics Laboratory Ma Delhi.

Reference Books

1. Garde R.J., *Fluid Mechanics,* New Age International Publishers, New Delhi.
Jagdish Lal, *Hydraulics & Hydraulic Machines,* Metropolitan Book Depot, Delhi.

List of Practical's :

1 Measurements of pressure and pressure head by Piezometer, U-tube manometer.

2 Measurement of pressure difference by U-tube differential manometer. Study of bourdon's gauge.

3 Verification of Bernoulli's theorem.

4 Reynolds experiment to study types of flow.

5 Determination of Darcy's friction factor for a given pipe.

6 Determination of Minor losses in pipes (any two).

7Determination of Manning's constant or Chezy's constant for given rectangular channel section.

DCE-0305 BUILDING DRAWING& DESIGN

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total	Grand Total	
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0305	BUILDING DRAWING& DESIGN	3	1	2	6	70	22	10	20	100	30	09	20	50	150	03 Hrs

UNIT- I   Marks : 14
CONVENTIONS
Conventions as per IS:962-1967 and other practices Types of Lines – Visible line, enterline, Hidden line, Section line, Dimension line, Extension line, Pointers, Arrow heads or dots. Dimensioning ystems. Symbols – Materials used in construction, building components. Reading of available ammonia prints of esidential buildings.

UNIT- II   Marks : 14
PLANNING OF BUILDING
Principles of planning of Residential and Public building. Space requirements and norms for various units of Residential and Public building. Rules and byelaws of local governing authorities for construction. Drawing of line plans for Residential and Public building

UNIT- III   Marks :14
BUILDING DRAWING
Development of plan from line plan of a residential building, Elevation, Section, Site plan, Location Plan, Foundation plan, Area statement and other details. Submission Drawing and Working rawing.

UNIT- IV   Marks : 14
DETAILED DRAWING
Drawing of staircase, drawing of steel truss & lean to roof, drawing of layout plan of water supply line with accessories. Layout plan of sanitary line - position of inspection chamber, septic tank, sanitary fittings. Position of wash basin, sink etc.

UNIT- V   Marks : 14
PERSPECTIVE DRAWING
Definition, Necessity, Principles of Perspective Drawing, Terms used in perspective drawing, Two point perspective view of a small object like pedestal, step block, small single storied building with flat roof etc.

Text Books
1. BUILDING DRAWING& DESIGN BY MU & MALLICK

Reference Books
1. BUILDING DRAWING& DESIGN BY MU & MALLICK

List of Experiments:

1. Drawing various types of lines, lettering and symbols of materials, doors and windows etc. Used in construction on Full Imperial size drawing sheet.

2. Drawing the lines plans of following buildings on Full Imperial size graph

3. Residential Building (Min. three rooms)

4.Public Building – School building, Primary health center / Hospital

5. Measured Drawing of an existing resident ial Building (Load bearing/ Notes, Schedule of openings, Site Plan, Area statement etc.

6.Submission Drawing of two storied residential building (Framed structure type) showing Plans , Elevation, Sections, Foundation Plan ,construction, notes, Schedule of openings, Site Plan ,Area statement etc.

7.Working drawing of above drawing sheet preferably one plan, section

8. Two point perspective view of a building drawn in submission drawing.

9. Tracing of a submission drawing prepared at Sr. No.4 above.

10. Ammonia print of submission drawing prepared at Sr. No.4 above.

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DCE-0401 ADVANCED SURVEYING

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total		
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0401	ADVANCED SURVEYING	3	1	2	6	70	22	10	20	100	30	09	20	50	150	03 Hrs

UNIT- I   Marks : 14
PLANE TABLE SURVEY
Principles of plane table survey. Accessories required. Setting out of plane table , Leveling ,Centering and orientation. Methods of plane table surveying – Radiation, Intersection, and raversing. Merits and Demerits of plane table Surveying. Situations where plane table survey is used. Use of Telescopic Alidade.

UNIT- II   Marks : 14
THEODOLITE SURVEY
Components of Transit Theodolite and Their functions. Technical terms used. Temporary adjustments of Transit Theodolite. Swinging the telescope, Transiting, Changing the face. Measurement of Horizontal angle, method of Repetition, errors eliminated by method of repetition. Measurement of Deflection angle. Measurement of Vertical angle. Measurement of magnetic bearing of a line by Theodolite. Prolonging a Straight line. Sources of errors in Theodolite Surveying. Permanent adjustment of transit Theodolite (only relationship of different axes of Theodolite.) Traversing with Theodolite – Method of included angles, locating details, checks in closed traverse,Calculation of bearings from angles. Traverse Computation - Latitude, Departure Consecutive Co-ordinates error of Closure, Distribution of a angular error, balancing the traverse by Bodwitch rule and Transit Rule, Gale's traverse table simple problems on above topic.

UNIT- III   Marks : 14
TACHEOMETRIC SURVEY
Principle of Tacheometry. Essential requirements of Tacheorneter. Use of Theodolite as a Tacheometer with staff held in vertical and fixed hair method (No derivation). Determination of tacheometric constants, simple numerical problems on above topics

UNIT- IV   Marks : 14
CURVES
Types of curves used in road and railway alignments. Notations of simple circular curve. Designation of curve by radius and degree of curves. Method of Setting out curve by offset from Long chord method and Rankine's method of deflection. angles. Simple Numerical problems on above topics.

ADVANCED SURVEY EQUIPMENTS
Construction and use of one second Micro Optic Theodolite, Electronic Digital Theodolite. Features of Electronic Theodolite Principle of E.D.M, Components of E.D.M and their functions, use of E.D.M. Total station

UNIT- V **Marks : 14**
AERIAL SURVEY AND REMOTE SENSING
Aerial Survey Introductions, definition, Aerial photograph. Remote Sensing – Introduction, Electro-Magnetic Energy , Remote sensing system- Passive system , Active system. Applications – mineral, land use / Land cover, Natural Hazards and Environmental engineering system

Text Books
1. ADVANCED SURVEYINGBY S.K DUGGAL.

Reference Books
1. ADVANCED SURVEYINGBY S.K DUGGAL.

List of Experiments:

1. Using accessories carry out temporary adjustments of plane table. Locating details by method of Radiation.

2. Locating details with plane table by method of intersection.

3. Understanding the components of Theodolite and their functions, reading the vernier and temporary

adjustments of theodolite.

4. Measurement of Horizontal angle by transit theodolite.

5. Measurement of Horizontal angle by method of Repetition.

6. Measurement of vertical angles by theodolite.

7. Measurement ofMagnetic bearing of a line using theodolite

8. Measurement of deflection angle by taking open traverse of 4 –5 sides.

9. To find reduced levels and horizontal distances using theodolite as a Tachometer.

10. To find constants of a given Tachometer

11. Study and use of 1 second Micro Optic Theodolite for measurement of Horizontal and Vertical angles.

12. Study of E.D.M. for knowing its components.

13. Use of EDM for finding horizontal and vertical distances and reduced levels.

14. Determine the geographical parameters by total station.

15. Use of Arial survey (GPS, goggle earth, ISRO satellite etc.

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DCE 0402 SOIL MECHANICS

Paper Code	Title of the paper	Period Per Week				Distribution of Marks										Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total			
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =		
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)		
DCE-0402	SOIL MECHNICS	3	1	2	6	70	22	10	20	100	30	09	20	50	150		03 Hrs

UNIT- I   Marks : 14
Introduction:- Definition of soil Mechanics and foundation engineering. Soil formation –different kinds of soils and soil structures, Fundamental definitions & their relationships:- Graphical representation of soil as a three phase system. Definitions of moisture content, unit weight of soil mass such as bulk density, saturated density, submerged density and dry density, specific gravity, mass specific gravity, void ratio, porosity and degree of saturation, percentage air voids and their content, density index. Relationships between various terms stated above. Consistency limits Liquid limit, Plastic limit, Shrinkage limit, Plasticity index, Consistency index. Grain size analysis - Sieve and Hydrometer analysis, C.C. and C.U

UNIT- II   Marks : 14
Classification of soils:- Particle size classification - M.I.T., and I.S., U.S. bureau of soils and U.S., P.R.A. Textural classification chart, brief description of plasticity chart. I.S. soil classification, Permeability of soils:- Definition of permeability. Interpretation of Darcy's law, definition of discharge, velocity and seepage velocity and coefficient of percolation. Factors affecting permeability. Laboratory methods of falling head and constant head, field methods of pumping- out tests and pumping-in tests.

UNIT- III   Marks : 14
Compaction:- Definition of Compaction. Standard & modified Procter compaction test Different methods of compaction. Factors affecting compaction, Brief description of field compaction methods. Compacting equipments and field control, Indian Standards, Consolidation:- Definition of consolidation and its effect on foundation settlement. Difference between consolidation and compaction.

UNIT- IV   Marks : 14
Shear strength:- Definition of shear strength. Definition of Cohesive (c) & non cohesive (Phy.), soil. Coulomb's equation. Shear box and unconfined compression tests, Earth pressure and earth retaining structures :- efinition of earth pressure, active and passive, earth pressures, terms and symbols relating to a retaining wall. Relation between movement of wall and earth pressure. Ka and Kb by Rankin's Method. Simple earth pressure alculations without surcharge.

UNIT- V   **Marks : 14**

Shallow and deep Foundation:- Definitions of shallow and deep foundations. Types of shallow and deep oundations. Application of Terzaghi's bearing capacity formulae for different types of foundations. Factors affecting depth of shallow foundation. Classification of piles. Plate bearing tests for shallow foundations.

Text Books

1. Sehgal S.B., Soil Mechanics, C.B.S. Publishers & Distributors Pvt. Ltd., New Delhi.

2. Dr. Alam Singh, Basic Soil Mechanics & Foundations, C.B.S. Publishers & Distributors,

New Delhi.

3. Minocha & Diwedi, Soil Mechanics, B. Bharat Prakashan, Meerut.

4. Gadi S.K., Soil Mechanics, B.Tech Publichers, Lucknow.

5. Sharma S.K., Soil Mechanics, Aisan Publishers, Muzaffarnagar.

Reference Books

1. Punmia B.C., Soil Mechanics & Foundation Engineering, Laxmi Publication Pvt. Ltd.,

New Delhi.

2. Lambi, Soil Mechanics.

List of Experiments:

1. Determination of moisture content by oven drying method.

2. Determination of specific gravity of soil particles by specific gravity bottle/pycnometer.

3. Determination of soil particles size distribution by sieving.

4. Determination of liquid limit and plastic limit of soil.

5. Determination of permeability by constant Head Permeameter and falling head

permeameter.

6. Shear strength of clean sand by Shear Box text.

7. Unconfined compression test.

8. Standard Proctor compaction text.

9. Determination of field density of soil by sand replacement and cutter methods.

10. Determination of Standard Penetration Test.

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DCE-0403 MECHANICS OF STRUCTURES

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total	Grand Total	Duration of Exam
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0403	MECHANICS OF STRUCTURES	3	1	2	6	70	22	10	20	100	30	09	20	50	150	03 Hrs

UNIT- I   Marks : 14
Bending Moment and Shear Force
Concept of a beam, and supports (Hinged, Roller and Fixed). Types of Beams: Simply supported, cantilever, fixed, overhang and continuous beams. Types of loads (distributed and point). Concept of Bending Moment & Shear Force. Sign conventions. Bending moment and shear force diagrams for cantilever, simply supported and overhanging beams subjected to uniformly distributed and concentrated loads. Relationship between load, shear force and bending moment. Point of maximum B.M. and contra flexure.

UNIT- II   Marks : 14
Bending and Shear Stresses
Assumptions of theory of simple bending. Derivation of the equation. $M/I=F/Y=E/R$. Concept of centroid and second moment of area, Radius of gyration, Theorems of parallel and perpendicular axes, Second Moment of area for sections: rectangle, triangle, circle, trapezium, angle, Tee, I, Channel and compound sections. Moment of resistance, section modulus and permissible bending stresses, Bending stresses in circular rectangular, I,T and L section. Comparison of strength of the above sections. Concept of shear stresses in beams, Shear stress distribution in rectangular, I and T section.

UNIT- III   Marks : 14
Combined Direct & Bending Stresses and strain Energy Concentric and eccentric loads, eccentricity, effect of eccentric load on the section, middle third rule; stresses due to eccentric loads. Examples in the case of short columns, chimneys and dams. Meaning of strain energy and resilience. Derivation of formula for resilience of a uniform bar in tension.

UNIT- IV   Marks : 14
Slopes and Deflections of Beams
Definition of slope and deflection, sign convention. Circular bending. Calculation of maximum slope and deflection for the following standard cases by moment area method.

(1) Cantilever having point load at the free end., Cantilever having point load at any point of the span., Cantilever with uniformly distributed load over the entire span., Cantilever having U.D.L. over part of the span from free end Cantilever having U.D.L. over a part of span from fixed end
(2) Simply supported beam with point load at centre of the span. Simply supported beam with
U.D. load over entire span.

UNIT- V   **Marks : 14**
Columns & Struts
Definition of long column, short column and strut, slenderness ratio, equivalent length, critical load, collapse Load, End conditions of column. Application of Euler's and Rankine's formula (no derivation), simple numerical problems based on Euler's and Rankine's formulae.
Torsion
Definition of torque and angle of twist. Derivation of torsion equation. Polar moment of inertia. Strength of hollow and solid shaft, advantage of a hollow shaft over a solid shaft. Comparison of weights of solid and hollow shafts for same strength. Horse Power transmitted. Calculation of shaft diameter for a given Horse Power

Text Books
1. Rajput R. K., *Strength of Materials,* S.Chand & Co. Ltd., Delhi.

2. . Kapoor J.K., *Strength of Materials,* Asian Publication, Muzaffarnagar.

3. Punmia B.C., *Strength of Materials,* Laxmi Publication, Delhi.

Reference Books
1. Ramamarutham S., *Strength of Materials,* Dhanpat Rai & Sons, DelhI.

Experiments:
1. Determination of shear force at different sections on a simply supported beam under points loads.

2. Determination of bending moment at different sections on a simply supported beam under different types of loading.

3. Determination of yield stress, ultimate stress, percentage elongation, plot the stress strain diagram and compute. the value of Young's Modulus of mild steel.

4. Determination of the maximum deflection and Young's Modulus. of elasticity by deflection apparatus.

5. Determination of modulus of rigidity of material by Torsion apparatus.

6. Determination of hardness of a metal plate by Rock Well Brinell hardness testing machine.

7. To perform impact test on Izod Impact testing machine.

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the
faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 - 5 on each topic. The
topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

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DCE-0404 TRANSPORTAION ENGG.-I

Paper Code	Title of the paper	Period Per Week				Distribution of Marks										Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total			
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =		
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)		
DCE-0404	TRANSPORTATION ENGINEERING-I	3	1	-	4	70	22	10	20	100	-	-	-	-	100	100	03 Hrs

UNIT- I   Marks : 14
OVERVIEW OF TRANSPORTATION ENGINEERING
Role of transportation inthe development ofnation. Mode of transportation system – roads, railway,airways, waterways, Importance of each mode, comparison and their relative merits and demerits. Necessity importance of Cross drainage works for roads & railways.

UNIT- II   Marks : 14
RAILWAY ENGINEERING
Alignment and Gauges,Classification of Indian Railways, zones of Indian Railway. Alignment- Factors governing rail alignment. Rail Gauges – types,factors affecting selection of gauge. Rail track cross sections – standard cross section of BG & M.G Single & double line in cutting and embankment, Permanent ways.

UNIT- III   Marks : 14
IDEAL REQUIREMENT, COMPONENT PARTS
Rails – function & its types. Rail Joints – requirements, types, Creep of rail,causes & prevention of creep leepers – functions & Requirement, types – wooden, metal, concrete sleepers & their suitability, sleeper density. Ballast – function & different types with their properties, relative merits & demerits. Rail fixtures &fastenings – fish plate, bearing plates, spikes, bolts, keys,anchors & anti creepers. RailwayTrack Geometrics. Coning of wheels, tilting of rails, Gradient & its types,Super elevation, limits of Super elevation on curves, Inspection of points and crossings. Station and Yards : Site selection for railway stations, Requirements of railway station, Types of stations (way side, crossing, junction & terminal) Station yards , types of station yard, Passenger yards, Goods yard Locomotive yard, its requirements, water column , Marshalling yard, its types. Track Maintenance - Necessity, types, Tools required and their function, organization, duties of permanent way inspector, gang mate, key man.

UNIT- IV   Marks : 14
BRIDGE ENGINEERING
Site selection and investigation Factors affecting selection of site of a bridge Bridge alignment Collection of design data Classification of bridges according to function, material, span, size, alignment, position of HFL.

Component parts of bridge.Plan & sectional elevation of bridge showing component parts of substructure & super structure. Different terminology such as effective span, clear span, economical span, waterway, afflux, scour, HFL, freeboard, etc. Foundation – function, types Piers-function, requirements, types.Abutment – function, types, Wing walls – functions and types. Bearing – functions, types of bearing for RCC & steel bridges. Approaches – in cutting and embankment.Bridge flooringopen and solidfloors. Permanent and Temporary Bridges- Permanent Bridges – Sketches & description in brief of culverts, causeways, masonry, arch, steel, movable steel bridges, RCC girder bridge, pre-stressed girder bridge, cantilever, suspension bridge. Temporary Bridges- timber, flying, floating bridges Inspection &Maintenance Of Bridge - Inspection of bridges, Maintenance of bridges & types, routine & special maintenance.

UNIT- V   Marks : 14
TUNNEL ENGINEERING
Definition, necessity, advantages, disadvantages Classification of tunnels.Shape and Size of tunnels. Tunnel Cross sections for highway and railways. Tunnel investigations and surveying –Tunnel surveying locating center line on ground, transferring center line inside the tunnel. Shaft - its purpose & construction. Methods of tunneling in Soft rock needle beam method, fore-poling method. line plate method, shield method. Methods of tunnelling in Hard rock – Full face heading method, Heading and bench method,drift method.Precautions in construction of tunnels Drilling equipments-drills and drills carrying equipments. Types of explosives used in tunnelling.Tunnel lining and ventilation.

Text Books
1. Khanna & justo, nem chand & bros. roorkee.

2. B.l. gupta

.

Reference Books
(1) Khanna & justo, nem chand & bros. roorkee

(2) B.l. gupta

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DCE-0405 ENTREPRENURSHIP

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Grand Total (H= D+G)	Duration of Theory Exam
						Theory					Practical						
						End Sem.		Internal		Total (D= A +B+C)	End Sem.		Internal	Total (G= E+F)			
		L	T	P		Max (A)	Min	TW (B)	MST (C)		Max (E)	Min	LW (F)				
DCE-0405	ENTREPRE NURSHIP	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs	

UNIT- I   **Marks : 14**
INTRODUCTION TO ENTERPRENEURSHIP Definition of Entrepreneur / Entrepreneur. Difference between Entrepreneurship / Entrepreneurship. Need for Entrepreneurship qualities of successful entrepreneur. Method about Entrepreneurship. Classification of entrepreneurs on the basis of different criteria. Reasons for the failure of entrepreneurs.

UNIT- II   **Marks : 14**
INDUSTRIES AND BUSINESS ORGANIZATIONS Concept of Industry or Enterprise. Classification of Industries.(a) On the basis of capital investment .Tiny (Micro) Industry. Small Scale. Medium Scale. Large Scale.(b) Others. Rural Industry. Cottage Industry.(c) Forms of Business Organization .Proprietorship. Board & Co-operative. Partnership. Public Ltd..
 INCENTIVES / CONCESSION / FACITLITIES AVAILABLE Seed money. Incentive subsidies. Others (Phones, Lands etc).

UNIT- III   **Marks : 14**
PLANNING OF AN INDUSTRIAL UNIT (SSI)Pre- Planning Stage. Scanning the environment.
 Market survey. Seeking information. Product project selection. Implementation Stage.PPR Preparation.DIC registration. Arrangement of Land. Arrangement of Power. Obtaining NOC / Licenses from various departments. DPR Preparation. Seeking financial assistance. Commercial Production .Post Implementation stage. Permanent registration from D.I.C. Availing Subsidies. Diversification / Modification. Setting up of marketing channel / Distribution. Private Ltd. IT Sector.
Government Co-operative / Undertakings.(d) Tiny small scale Industry. Definition Its significance in National Development. Govt. policies for SSI promotions

UNIT- IV   **Marks : 14**
ACHIVEMENT MOTIVATION Historical perspective. Concept of achievement motivation. Significance of achievement motivation. Development of achievement motivation

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UNIT- V   Marks : 14
FINANCIAL MANAGEMENT OF AN INDUSTRIAL UNIT (SSI) Tools of financial analysis.
 Ratio analysis. Fund Flow / Cash flow analysis. Working capital and concepts. Financial accounting.

REFERENCES

1.Entreprenerial Development Vol. I,II,III

By Vasant desai Himalaya Publicaton

2.CEDMAP (Center of Entrepreneurial development Madhya Pradesh)

3.Udyamita Vikas

By Anand Prakashan

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DCE-0501 Irrigation Engg.

Paper Code	Title of the paper	Period Per Week				Distribution of Marks									Grand Total	Duration of Exam
						Theory			MST	Total	Practical		TW	Total	Grand Total	
		L	T	P	C	Max	Min	TW		(d) =	Max	Min		(h) =	(i) =	
						(a)	(b)	(c)	(d)	(a+c)	(e)	(f)	(g)	(e+f)	(d+h)	
DCE-0501	Irrigation Engg.	3	1	-	4	70	22	10	20	100	-	-	-	-	100	03 Hrs

UNIT- I   Marks : 14
INTRODUCTION
Definition – Irrigation and irrigation engineering, advantages of irrigation, ill effects of over irrigation, and types of irrigation project purpose wise and administrative wise, Methods of irrigation. Analyze data for irrigation project, supervision of reservoir and canal structure, weir and barrages, lift irrigation scheme, its suitability, advantages and limitations Capacity of reservoir, Principle of Hydrology Relation between water and crop Rainfall, Crops, Dams Weir, Barrages, Area Capacity curve Capacity Canal Concept of runoff duty delta and base period

HYDROLOGY
Hydrological cycle, Definition of rainfall, rain gauge and rain gauge station, types of rain Gauges (names only) average annual rain falland its calculation , definition of runoff, factor affecting run off, calculation of run off by runoff coefficient, English formula , Stranges andBinnie's tables and curves. Maximum flood discharge and methods of calculation. Unit hydrograph Yield and Dependable yield and methods calculation.

UNIT- II   Marks : 14
WATER REQUIREMENT OFCROPS
Cropping seasons and crop in Madhya Pradesh. Definition – Crop period base period Duty Delta, Factors affecting Duty, relation between Duty Delta and base period Definition – CCA, GCA, IA, intensity of irrigation time factor capacity factor. Crop rotation. Problems on water requirement and capacity of canal. Assessment of irrigation water

INVESTIGATIONAND RESERVOIR PLANNING
Survey for irrigation project data collected for irrigation project. Area capacity curve, silting of reservoir, rate of silting, factors affecting silting, methods to control levels and respective storage in reservoir. Fixing control levels

UNIT- III   Marks : 14
DAMS AND SPILLWAYS
Types of dams – Earthen dams and Gravity dams (masonry and concrete) Comparison of earthen and gravity dams with foundation, seepage, construction and maintenance Earthen Dams – Components and Their function, typical cross section seepage through embankment and foundation seepage Control though embankment and foundation .Methods of constructions, types of failure of Earthen dams and remedial measures. Gravity Dams

Theoretical and practical profile, typical Cross section, drainage gallery, joint in gravity dam, high dam and low dam Spillways-Definition, Function, location and components. Emergency and services, ogee spillway and bar type spillway, discharge over spillway. Spillway with and without gate.

UNIT- IV   Marks : 14
SMALL IRRIGATION STRUCTURE, BANDHARA,PERCOLATION TANKS AND LIFT IRRIGATION

Advantages and disadvantages of Bandhara irrigation layout and component parts, solid and Open Bandhara. Percolation Tanks – necessity and importance, selection of site. Layout of lift Irrigation scheme. Irrigation department standard design and specification. Small irrigation structures, like Stop dam, stop dam cum causeway, ring bund , small ponds

DIVERTION HEADWORKS

Weirs – components parts, unction and types, layout of diversion head works wits its components and their function, canal head regular, silt excluders and silt ejectors. Barrages components and their function. Difference between weir and barrage irrigation department standard design and specifications.

UNIT- V   Marks : 14
CANALS

Classification of canals according to alignmentand position in the canal network. Design of mosteconomical canal section. Canal lining –Definition, purpose, types of canal liningadvantages of canallining properties of goodcanal lining material. CD. works- different C.D.works, canal falls, escapes, crossregulators andcanal outlets

Text Books

1. Irrigation and water powerEngineeringB.C. Punmia

2. Introductory IrrigationEngineeringB.C. Punmia Laxmi Publication,Delhi.

Reference Books

1 Irrigation and water powerEngineeringB.C. Punmia

2. Introductory IrrigationEngineeringB.C. Punmia Laxmi Publication,Delhi.

3 Fundamental principle ofIrrigation EngineeringV.B. Priyanis.

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DCE502- Q.S.C.-I

Paper code	Title of the Paper	L	T	P	C	Theory		MST (c)	Total (d = a+c)	Practical		TW (g)	Total (h= e+g)	Grand Total (i= d+h)	Duration of Exam
						Max (a)	Min (b)			Max (e)	Min (f)				
DCE-0502	Q.S.C.-I	3	1	2	6	70	22	20	100	30	09	20	50	150	3 Hour's

UNIT- I   Marks : 14
Overview Of Estimating &Costing
Meaning of the terms estimating, costing. Purpose of estimating and costing .Types of estimate - Approximate and Detailed. Approximate estimate Types- Plinth area ratemethod, Cubic Content method, Service Unit method,Typical bay method, Approximate Quantity method ,Problems onPlinth area rate method & application ofService unit method for selection of service unit fordifferent types of civil Engineering Structures. Types of detailed estimate Detailed estimate for new work. Revised estimate. Supplementary estimate.Revised & Supplementary estimate. Maintenance &Repair estimate. Uses of detailed estimate

UNIT- II   Marks : 14
Detailed Estimate
Unit quantity method, Total quantity method, Data required for detailed estimate. Factors to be Considered during preparation of detailed estimate, Specification, Quantity availability of material, Location of site, Labour Component. Steps in preparing detailed estimate. Takingoutquantities, squaring, abstracting. Preparing check list – by adoption of Sequence ofexecution. drafting Brief Specification of items, contents of measurement Sheet , Abstract sheet ,face sheet Mode ofMeasurements. General Rules for fixing units of Measurements fordifferent– items of work as per IS 1200 & As per PWD Hand BookDesired accuracy in taking measurements of variousitems of work & rules for deductions as per IS 1200 &P.W.D. handbook.

UNIT- III   Marks : 14
Procedurefor PreparingDetailed EstimateProcedure for taking out quantities for various items of works by P.W.D & IS 1200 for. a) for Load bearing Structure –Long Wall and short wall method , Center line method, (b) Framed Structure building. - By using thumb rules for reinforcement quantity calculation - By preparing bar bending Schedule Provisions in detailed estimate for contingencies, work charged establishment, Provisional items, Provisional Sum, Provision for water Supply & Sanitary works, Electrical wiring & installations, centage charges, Tools & Plants,Prime cost, Day work.

UNIT- IV   **Marks : 14**
Rate analysis Meaning of term Rate analysis –Factors affecting rate analysis, lead, lift, task work, materials and labour component, Market Rate and labour rate.Transportation of Materials, load factor for different materials. Standard lead , extra lead, TransportationCharges , Labour - Categories of labours, labour rates,overheads contractor's profit, water charges, taking outquantities of materials for different items of works.Preparing rate analysis of different items of workStandard Schedule ofrates, full rates & labour rates.

UNIT- V   **Marks : 14**
Taking out quantities of work for different Civil Engineering Works Roads, Dam, Canals, Railway embankments, methods of mean area, mid sectional area, trapezoidal, Prismoidal formula. Calculation of quantity of earth work. Estimate of Road of 1km. length for pavement surface WBM Bitumen Cement concrete road Use of software for estimation & for analysis of rates.
Procedure of

Text Books
1. Estimating & costing S.C. RangwalaCharotarPublication Anand

Reference Books
S.No. Title Author Publisher

01 Estimating & costing in CivilEngineeringB.N. Datta UBS Publishers DistributorsPvt Ltd New Delhi

02 Estimating & costing,Specification and ValuationinCivil Engineering,M. Chakraborti M.Chakraborti ,Calcutta

03 Estimating & costing S.C. RangwalaCharotarPublication Anand

List of Assignments:

1) Prepare Check list of items of following type of Civil Engineering works.

a) Load Bearing type Building

b) Framed structure type building

c) W.B.M.Road

d) Septic Tank

e) Community well

2) Writing the rules of deduction's for below mentioned items of work as per IS 1200.

a) Brick / Stone masonry.

b) Plastering / Pointing

3) Taking out quantities of various items of work for load bearing building.

i) Earth work in excavation for foundation

ii) Base Concrete of foundation

iii) U.C.R. /BB Masonry work in foundation and plinth.

iv) D.P.C.

4) Taking out quantities of following items for small R.C.C. Hall

i) Concreting for footing, Column, Beam, slab.

ii) Reinforcement for above items by preparing Schedule of bars.

iii) Form work for all above items.

5) Preparing detailed estimate of a RCC single & two storied residential building for all items

of work. (The quantity of reinforcement shall be calculated by percentage.)

6) Preparing Rate analysis of following items:

Building work – Brick work, P.C.C., R.C.C., Plastering, Flooring, Doors, Windows.

7) Taking out quantities of earth work for a Road profile prepared in surveying subject.

Prepare the lead statement.

Swami Vivekanand University, Sagar(M.P.)

DCE-0503 Work Organization & Management

Paper code	Title of the Paper	Periods Per week				Distribution of Marks									Grand Total (i= d+h)	Duration of Exam
						Theory				Practical						
		L	T	P	C	Max (a)	Min (b)	MST (c)	Total (d = a+c)	Max (e)	Min (f)	TW (g)	Total (h= e+g)		
DCE-0503	Work organization & management	3	1	0	4	70	22	20	100	-	-	-	-	100	3 Hour's

UNIT- I   Marks : 14

Execution ofwork byP.W.D, Organization of P.W.D. functions of their personnel.P.W.D. procedure of initiating the work administrativeapproval, technical sanction, budget provision. Methodused in P.W.D. for carrying out works contract methodand departmental method, Rate list method, piece work method, day's work method, department method.(NMR and casual muster roll),Contract Definition of contract, objects of contract, requirementsof valid contract. Types of engineering contract- Lumpsum contract, item rate contract, percentage ratecontract, cost plus percentage, cost plus fixed fee, costplus variable percentage and cost plus variable feecontract, labor contract, demolition contract , feecontract, target contract, negotiated contract. Class ofcontractor, Registration of contractor. BOT Project.

UNIT- II   Marks : 14

Tender &Tender documents Definition of Tender, necessity of Tender, Types of Local & Global .Tender Notice, points to be included while drafting Tender Notice, Drafting of Tender Notice. Meaning of terms: Earnest money, security deposit, validity period, right to reject one or all tenders, corrigendum to tender notice and its necessary. Tender documents – List, scheduled A, Schedule B, Schedule C. Terms related to Tender documents –Contract conditions, time limit, time extension, penalty, defective material and workmanship, Termination of contract, Suspension of work, subletting of contract, extra item, escalation, arbitration, price variation clause, defect liability period, liquidated and un liquid at ed damages, Filling the tender by contractor and points to be observed by him. Procedure of submitting filled in Tender document. Procedure of opening tender, comparative statement, scrutiny of tenders, award of contract, acceptance letter and work order. Unbalanced Tender, Ring Formation.

UNIT- III   Marks : 14

Accounts of P.W.D, Various Accounts Forms and their uses –measurement, Books, Nominal Muster Roll, Im prest Cash, indent, Invoice, Bills, Vouchers, Cash Book, Temporary advance Payment to Contractors Mode of payment to the contractor : Interim pay mentand its necessity, Advance payment, secured advance, on account payment, Final payment, first and final payment, retention money, reduced rate payment, petty advance, mobilization advance, Specifications Necessity and importance of specifications of an item points to be observed in framing specifications of an item, types of specification. Brief and detailed, standard and

manufacturers specifications. Preparing detailed specifications of items in Civil engineering works, standards specification book .Legal aspects of specification.

UNIT- IV   Marks : 14
CASH, BILLS,AUCTION &T.A. RULES
Procedure to settle account of money received, modes of payment, permanent and temporary advance, comparison, checking of bills and vouchers, auction procedure, T.A. rules etc.

UNIT- V   Marks : 14
TIMESCHEDULEFOR WORKS
Importance of management of works Gantt bar chart, limitation of chart, CPM network, project chart 08 MISCELLANEOUS :Necessity of maintaining daily dairy, need for presence of sub engineer, A/R & S/R , charge to be handled to be cash transferred, inspection of rest houses. Measures to improve the efficiency of labour, causes of accident, trade unions, aims of labour legislation, labour courts, attitude so f sectional officers towards labour

Text Books
1. A.B.C. of PWD Accounts C.M. Kaul

2. Overseer accounts & Duties Kumar

Reference Books
S.No. Title Author Publisher

01 A.B.C. of PWD Accounts C.M. Kaul

02 Overseer accounts & Duties Kumar

03 PWD Managements, Accounts

& Labour Relation

H.S. Pandit

04 Construction Management &

PWD Accounts

Agrawal & Arora

05 MPPWD Manual Vol-I & Vol-II

06 Manual of Labour Relations R.C. Shrivastava

07 Civil Engineering management O.N. Wakhle, D.K. Publisher

08 Estimating & costing in civil Eng B.N. Datta USB Publisher

09 Estimating & costing G.S. Birdie Dhanpat rai & son

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Assignments :

1. Collecting old set of tender document and writing a report on it.

2. Collection of tender notices published in newspapers for various items of civil engineering works (At least 5) write salient features of them.

3. Drafting Tender Notice for construction of a Civil Engineering work (W.B.M. Road, Residential Building)

4. Preparation of Tender Document for the building. (Detailed Estimate prepared for R.C.C. building in estimating and costing shall be used)

5. Collection of various account forms from PWD & wiring report on in it.

6. Writing a report on store procedure and account producer of PWD. For it A – a) Guest Lecture of PWD Official may be arranged.

7. Writing detailed specifications for one item from each of following :

A) Building construction system.

B) Irrigation engineering system.

C) Transportation engineering system.

D) Environment engineering system.

8. Preparing muster rolls.

9. Preparing imprest account and temporary advance forms and developing skill for filling in forms.

10. Solving CPM and Net work problems

11. CPM PERT RELATED SOFTWARE

12. Preparation a ' E" Tendering of a particular project .

VISITS:

1. Visit to public sector/Govt. Industry/ Organization.like PWD ,RES,

2. Visit to private sector Industry.

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DCE504 Transportation Engg.-II

Paper code	Title of the Paper	Periods Per week				Distribution of Marks								Grand Total (i= d+h)	Duration of Exam
						Theory				Practical					
		L	T	P	C	Max (a)	Min (b)	MST (c)	Total (d = a+c)	Max (e)	Min (f)	T W (g)	Total (h= e+g)		
DCE-0504	Transportation Engg.-II	3	1	2	6	70	22	20	100	30	09	20	50	150	3 Hour's

UNIT- I   Marks : 14
ROAD ENGINEERING
Importance of road in India. Classification of roads according to Nagpur plan (Location and function), and third road development plan. Traffic and tonnage, Classification of urban roads. Different road yojana ,likepradhan mantra gram sadak yojana ,Mukhyamantri sadak yojna.

INVESTIGATIONFOR ROADPROJECT
Reconnaissance survey, Preliminary survey and Location survey for a road project. Detailed survey for cross drainage- L-section and C/S sections. Fixing the alignment of Road, factors affecting alignment of road. Drawings required for road project- Key map, Indexmap, Preliminary survey plan an detailed location survey plan, L section andC/S sections cross drainage work, land acquisition plan. Survey for availability of Construction material, location plan of quarries

UNIT- II   Marks : 14
GEOMETRICDESIGN OFHIGHWAYS
Camber- definition, purpose, types, IRC –specifications. Kerbs, road margin, road Formation, right of way. Design speed- IRC –specifications. Gradient – definition, types, IRC specification. Sight distances– definition, types, IRC specification. Curves–Necessity, types– horizontal, vertical and transition curves. W idening of roads on curves. Super Elevation – definition, formula for calculating super elevation, minimum and maximum values of super elevation, and methods of providing super elevation. Sketching ofstandard C/S of national highway in embankment and cutting. Simple problems on geometric design of road

UNIT- III   Marks : 14
CONSTRUCTIONOF ROADSPAVEMENTS ANDMATERIALS
Types of road materials and Tests – soil, aggregates, bitumen, Cement Concrete. Test on soil sub grade- C.B.R. test, Test on Aggregate – Los Angeles abrasion, impact, and shape test. Tests on bitumen-Penetration, Ductility and softening point test. Pavement – objective of pavement, structure of pavement, function of pavement components, types of pavement. Construction of earthen road – general termsused- borrows pits, spoil bank, lead and lift, balancing of earthwork. Construction procedure. Soil stabilized roads – necessity, methods of soil stabilization, brief details of Mechanical soil stabilization. W ater bound macadam roads – materials used, size andgrading of aggregates and screening, construction procedure including precautions cutback, tar, common grades adopted for construction. Types of bituminous surface –prime coat, tack coat, seal coat, Surface dressing

– procedure of construction bituminous penetration macadam, andBitumen/Tar carpets procedure ofconstruction. Cement concrete pavements-Construction procedure and equipments,Construction joints, joint filler, joint sealer.

UNIT- IV   Marks : 14
TRAFFIC ENGINEERING
Traffic volume study, Traffic control devicesroadsigns, marking, Signals, Traffic Island. Road intersections-intersections at gradeand grade separator intersections. Roadaccident. Building code IS:1904. Definition of active earth pressure and passive earth pressure, structures subjected to earthpressure in the field

HILL ROADS
Parts and functions of hill road components,types of curves, Hill road formation. Landslides- causes and prevention. Structuresdrainagestructures

DRAINAGE OFROADS
Surface drainage – side gutter, catch waterdrains, surface drainage. Sub-surfacedrainage –Longitudinal drains and crossdrains

UNIT- V   Marks : 14
MAINTENANCEAND REPAIRS OFROADS
Necessity of maintenance of roads, Classification of maintenance operation –ordinary, routine and periodic maintenance. Maintenance of W .B.M., bituminous and cement concrete roads, ARBORICULTURE Road side arboriculture, necessity, planning of plantation of trees selection of types of threes and development of nursery considering the environment aspects purpose of reinforcement. Materials of reinforcement steel as are in forcing material. Types of steel used for reinforcement mild steel, Tor steel, permissible stresses in concrete and steel. Different mixes of concrete to be used for R.C.C. work use of I.S. code No.456-2000 and I.S. 875-1984 for designing R.C.C .structures. Introduction to RCC design software like STRUUDS, resist,

Text Books
1. N. Krishna Raju Prestressed Concrete

2. S.U. Pillai & Devdas Menon Reinforced concrete Design Tata Mcgraw Hill.

Reference Books
S.No. Authors Title Publisher

01 Dr. V.L. Shah & Late Dr. S.R. Karve. Limit State Theory & Design of Reinforced Concrete. Structure Publications

02 N.C. Sihna & S.K. Roy Fundamentals of Reinforced concrete. S.Chand& Company

03 N.Krishna Raju R.N. Pranesh Reinforced concrete Design (IS 456-2000) Principles & Practice New Age International

04 N. Krishna Raju Prestressed Concrete

05 S.U. Pillai & Devdas Menon Reinforced concrete Design Tata Mcgraw Hill.

06. P.C. Varghase Limit State Design of Reinforced Concrete. Prentice Hall of India.

07 Shah & Kale R.C.C. Design

List of Assignments:

1. Road project for a road of minimum 0.5 km. length having at least one small cross Drainage work, Site selection Reconnaissance survey.Fixing the alignment, Detailed profile survey along the alignment and cross section of road and CD Work, Prepare computer generated drawing of longitudinal section and typical cross sections of the road in cutting and filling, Prepare computer generated drawing of proposed typical CD work/culvert, (Using CAD).

2. Visit to a road under construction/constructed to study the construction of (a) WBM road (b) flexible pavement (c) Rigid pavement roads for observing the type of construction and construction equipments 3. Preparing drawings of detailed cross sections of (a) major district road (b) state Highway (c) National highway (d) Express Highway in cutting and banking showing details and dimensions with proper scale. (Any two).

3. Traffic volume study and its representation of an important road intersection in your city.

4. Visit to a W .B.M. and Bituminous road for observing the different types of defects in roads.

5. Prepare a visit report. W hich should consist of (a) List of various defects observed b) Suggestions regarding the possible remedial measure.

6. Types of road materials and Tests – soil, aggregates, bitumen, Cement Concrete, Test on soil sub grade-C.B.R. test, Test on Aggregate – Los Angeles abrasion, impact, and shape test. Tests on bitumen- Penetration, Ductility and Softening point test.

7. Study of Different Highway software. Road SOR , MOST 1- Geometrics 2- Pythagoras 3- C-Lx

DCE-0505 S.D.D.-I (RCC)

Paper code	Title of the Paper	Periods Per week				Distribution of Marks									Grand Total (i= d+h)	Duration of Exam
						Theory				Practical						
		L	T	P	C	Max (a)	Min (b)	MST (c)	Total (d = a+c)	Max (e)	Min (f)	TW (g)	Total (h= e+g)			
DCE-0505	S.D.D.-I (RCC)	3	1	2	6	70	22	20	100	30	09	20	50		150	3 Hour's

UNIT- I   Marks : 14
FIXED & CONTINUOUS BEAM
Concept of fixity, effect of fixity, advantages and disadvantages of fixed beam. Fixed end moments from first principle for beam subjected to UDL over entire span, central point load, Point load other than mid span. Application of standard formulae in finding moments and drawings'. and B.M. diagrams for a fixed beam.Clapevron's theorem of three moment (no derivation).Application of theorem maximum up to three spans and two unknown support moment only, Support at same level, spans having same moment of inertia subjected to concentrated loads and uniformly distributed loads over entire span. Drawing SF andBM diagrams for continuous beams.

UNIT- II   Marks : 14
Working Stress Method & Prestressed Concrete Introduction to reinforced concrete, R.C. Sections their behavior, grades of concrete steel. Permissible stresses, Assumptions inW.S.M. Equivalent bending stress distribution diagram for singly reinforced section. Concept of under-reinforced, over-reinforced and balanced section, neutral axis co-efficient Simple numerical problems on determining designconstants,momentofresistance and area of steel for Limit State Method Definition, types of limit states, partial safety factors for materials strength, characteristics strength, characteristics load, design load. Loading on structure as per I.S. 875.I.S. Specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing, minimum reinforcement in slab, beam & column, lapping, anchoring effective span for beam & slab.

UNIT- III   Marks : 14
Analysis and Design of Singly Reinforced Sections (LSM) 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. Concept of under-reinforced, over-reinforced and balanced section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for balanced singly R.C. Section. Simple numerical problems on determining design constants, moment of resistance and area of steel,

Analysis and Design of Doubly Reinforced Sections (LSM) General features, necessity of providing doubly reinforced section reinforcement limitations. Analysis of doubly reinforced section, strain diagram stress diagram, depth of neutral axis, moment of resistance of the section Simple numerical problems on finding moment of resistance and design of beam sections, Shear, Bond and Development Length (LSM) Nominal Shear stress in R.C. Section, design shear strength ofconcrete, Maximum shear stress, Design of shear reinforcement, Minimum shear reinforcement, forms of shear reinforcement. Bond and types of bond, Bond Stress, check for bond stress, Development length in tension and compression, anchorage value of hooks 90° bend and 45° bend Standard Lapping of bars, check for development length Simple 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; Determination of Development length required for tension reinforcement of cantilevers beams and slab, check for development length, Analysis and Design of T-Beam (LSM), General features, advantages, effective width of flange as perIS:456-2000 code provisions. 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. Design of T-beam for moment and shear for Neutral axis within or up to flange bottom. Simple numerical problems on deciding effective flange width.(Problems only on finding moment of resistance of T-beam section with N.A. lies within or up to the bottom of flange shall beasked in written examination.

UNIT- IV   Marks : 14
Design of Slab (LSM) Design of simply supported one-way slabs for flexure check for deflection control, and shear. Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear Design of two-way simply supported slab for flexure with corner free to lift. Design of dog-legged staircase. Simple numerical problems on design of one-way simply supported slabs cantilever slab & two –way simply supported slab, (No problem on design of dog-legged staircase shall asked in written examination.)

UNIT- V   Marks : 14
Design of Axially Loaded Column and Footing (LSM), Assumptions in limit state of collapse- compression. Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, squareand circular sections, diameter and spacing of lateral ties. Analysis and design of axially loaded short, square; rectangularand circular columns with lateral ties only, check for short column and check for minimum eccentricity may be applied.Types of footing, Design of isolated square footing for flexure and shear. Simple numerical problems on the design of axially loaded short columns and isolated square footing. (Problems on design of footing shall be asked in written examination for moment and two way shear only.) Principal of earth quake engineering
Introduction ,RICHTER SCALE, Soft story effect, detailing of structural elements ,ductile detailing ,earthquake zone in India Different earthquake I S codes (IS 1893-1984) IS4326-1976.causes of failure of structure during earth quake ,principal of constructing earthquake resistant buildings .

Text Books
1. One-way simply supported slab.

2. Two-way simply supported slab

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Reference Books

Sketch book consists of approximately ten plates from R.C.C. Design shall include important information of clauses of IS 456-2000 code. Typical sketches of components members/stress distribution & strain distribution diagrams R.C.C. section / detailing of reinforcement in joints / members. Design of R.C.C. structural components by LSM. Introduction to RCC design software STRUUDS The students should make detailed simple design and drawing of reinforcement detailing on two full imperial size sheets finished in pencil on any five of the following R.C.C. components members of a two-storied building with detailing of reinforcement (G+1) at the joints as per requirements & IS 13920.

1. One-way simply supported slab.

2. Two-way simply supported slab.

3. Cantilever slab/chajja.

4. T-Beam

5. Column and column footing.

6. Dog-legged staircase.

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DCE-0506 FIELD VISIT / SEMINAR

Paper code	Title of the Paper	Periods Per week				Distribution of Marks								Grand Total (i= d+h)	Duration of Exam
						Theory		MST (c)	Total (d = a+c)	Practical		TW (g)	Total (h= e+g)		
		L	T	P	C	Max (a)	Min (b)			Max (e)	Min (f)				
DCE-0506	Field visit/Seminar	-	-	2	2	-	-	-	-	30	09	20	50	50	3 Hour's

CONTENTS

1. FIELD VISITS –

Visit to a construction site where the RCC work is in progress Visit to a construction site where the irrigation work is in progress Visit to a bridge site. Batching plant for cement concrete and bituminous road Visit to water treatment plant Visit to a dam site Canal site Visit for a power plant site Visit for a construction site where multistoried mal /shoping complex i

2. SEMINAR –

Seminar on low cost housing , interlinking of rivers & irrigation structure rain water harvesting Cement concrete roads & joints in cement concrete roads . Traffic engineering Ductile detailing , use of different ISI codes for civil engineers ,releted to RCC & Earth quake resistant structureEarthquake resistant structure ,design concepts for buildings 1 Industrial /field /site Visits Structured industrial visits shall be arranged and report of the same should be submitted by the individual student, to form a part of the term work, Following are the suggested type of Industries/ Fields –(Any three visits)

i) Irrigation project for observing components of dam and canal.

ii) Concrete mixing & batching plant

iii) Residential apartment /public building to study plumbing system.

iv) Hot mix plant

v) Market rate analysis of different materials and labour rate for different type of civil works.

vi)Visit to a site where RCC work is in progress, slab casting Road work , Thermal Power Plant ..

2 The Guest Lecture/s from field/industry experts, professionals to be arranged

(2 Hrs duration), minimum 2 nos. from the following or alike topics The brief report to be submitted on the guest lecture by each student as a part of Term work.

a) Construction of highway, material of construction ,machinery used and manpower requirement .RMC ,Highway project (DPR)

b) To set up a small scale industry.

c) Planning and design of irrigation project. Lift irrigation project

d) design of earth quake resistant structures.

3 Information Search :-- data collection and writing a report on the topic

a) Collecting an estimate from P.W.D.

b) International Plumbing code and material specifications from market.

c) Collecting market rates for material and labor for building items .

d) Collecting D.S.R. /C.S.R. from PWD and its use for preparing revise estimate.

4 The students should discuss in group of six to eight students and write a brief report on the same as a part of term work. The topic of group discussions may be Selected by the facultymembers. Some of the suggested topics are -

i) Recent trends in civil engineering as a service industry.

j) Waterproofing and leakage prevention. sound proofing ,air ducting

k) Troubleshooting in plumbing system.

l) Causes of failure of road.

m)interlinking of rivers

n) traffic volume study

5 Seminar : Seminar topic shall be related to the subjects of fourth/fifth semester. Each student shall submit a report of at least 05 pages and deliver a seminar A power point presentation preferred to caliber student skill. (Presentation time – 5 minutes)

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DCE-0601 Public Health Engg. – II

Paper code	Title of the Paper	Periods Per week				Distribution of Marks								Grand Total (i= d+h)	Duration of Exam
						Theory		MST (c)	Total (d = a+c)	Practical		TW (g)	Total (h= e+g)		
		L	T	P	C	Max (a)	Min (b)			Max (e)	Min (f)				
DCE-0601	Public Health Engg. – II	3	1	2	6	70	22	20	100	30	09	20	50	150	3 Hour's

UNIT- I   Marks : 14

Quantity of Water & Source of water : Demands of water: Domestic, Industrial, Commercial &
Institutional, Public use, Losses and wastes, Fire demand ;Factors affecting rate of Demand, Variations of water demands, Forecasting of population, Methods of forecasting of population, Design period for water supply scheme. Estimation of quantity of water supply required for a town or city, Types of water supply schemes Source of water : Surface and Subsurface sources of water ,Ground water, Open well, Tube-Well, infiltration well, infiltration gallery, infiltration pipes. Construction of dug well. Construction of tube well, Well Testing. Yield of well., Intake Structures-Definition and types, Factors governing the location of an intake structure, Water conservation, Ground water recharging – Necessity Importance and advantages. Quality of Water & Purification of Water : Effect of different impurities on water, surface/ground water , Water borne disease. Need for analysis of water, Characteristics of water-Physical, Chemical and Biological, Testing of water for Total solids, hardness, chlorides, dissolved Oxygen, pH, Bacteriological tests, Sampling of water,

UNIT- II   Marks : 14

Water quality standards as per I.S. Purification of Water : Screening- Types of screens, Aeration- objects and methods of aeration, Plain sedimentation, Sedimentation with coagulation, principles of coagulation, types of coagulants, Jar Test, process of coagulation, types of sedimentation tanks, Filtration theory of filtration, classification of filters : slow sand filter, rapid sand filter, pressure filter, domestic filter, filter media, construction and working of slow sand filter and rapid sand filter, Disinfection: Objects, methods of disinfection, Chlorination- Application of chlorine, forms of chlorination, types of chlorination practices,
residual chlorine and its importance, Flow diagram of water treatment plants,

Conveyance and Distribution of Water : Types of Pipes used for conveyance of water, choice of pipe material, Types of joints & Types of valves- their use, location and function on a pipeline. Methods of distribution of water- Gravity, pumping, and combined system Service reservoirs – functions and types, Layouts of distribution of water- Dead end system, grid iron system, circular system, radial system ; their suitability, advantages and disadvantages

UNIT- III   Marks : 14

Conveyance and Distribution of Water : Types of Pipes used for conveyance of water, choice of pipe material, Types of joints & Types of valves- their use, location and function on a pipeline. Methods of distribution of

water- Gravity, pumping, and combined system Service reservoirs – functions and types , Layouts of distribution of water- Dead end system, grid iron system, circular system, radial system ; their suitability, advantages and disadvantages

UNIT- IV   Marks : 14
Systems of Sewerage : Types of Sewers, Systems of Sewerage, Principle of Design of sewers, self cleansing velocity and non scouring velocity Laying,   Testing and maintenance of sewers. Sewer Appurtenances, Manholes and Drop Manhole-component parts, location, spacing, Sewer Inlets ,Street Inlets, Flushing Tanks – manual and automatic
Analysis of Sewage :   Characteristics of sewage, B.O.D./ C.O.D. and significance. , Aerobic and anaerobic process, Madhya Pradesh Pollution Control Board Norms for the discharge of treated sewage.

UNIT- V   Marks : 14
Treatment of Sewage :   Objects of sewage treatment, General layout and flow diagram, Screening, Grit removal, Skimming, Sedimentation of sewage, Sludge digestion, Trickling filters, Activated sludge process,
Disposal of sewage, Septic tank, Oxidation pond, Oxidation ditch. Common Complaints in the operation of septic tank and remedies
Rural Sanitation : Environmental Sanitation Necessity and importance, Rural sanitation- Types of Privies – Aqua privy and Bore Hole Latrine construction and working Composting (Nadep or Vermiculture).

Text Books
1. Rangwala S.C, Water Supply & Sanitary Engineering, Charotar Publshing House (P) Ltd., Anand.

2. Gurcharan Singh, Water Supply & Sanitary Engineering, Standard Publishers Distributors, Delhi.

3. Garg S.K., Water Supply Engineering, Khanna Publishers, Delhi.

4. Gupta D.V., Water Supply & Sanitary Engineering, Asian Publishers, Muzaffarnagar.

Reference Books
1. Modi P.N., Water Supply Engineering, Standard Book House, Delhi.

List of Experiment

1. Turbidity test.
2. Colour test.
3. Test for PH, Hardness, Chlorides, Iron & manganese.
4. Test for B-Coil.
5. Test for residual chlorime.
6. Test for total, volatile, fixed suspended and settable.
7. Test for D.O., B.O.D., C.O.D. and starbility.
8. To determine suspended solids, dissolved solids and total solids of waste water sample.
9) Design the Septic Tank for the public building such as hostel or hospital. Draw Plan and Section of the same along with the
drainage arrangement in soak pit.

(B) VISITS :

1. Intake site and adjoining pumping station.
2. Water treatment plant and testing lab.
3. Sewage treatment plant.

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DCE602- Q.S.C.-II

Paper code	Title of the Paper	Periods Per week				Distribution of Marks								Grand Total (i= d+h)	Duration of Exam
						Theory				Practical					
		L	T	P	C	Max (a)	Min (b)	MST (c)	Total (d = a+c)	Max (e)	Min (f)	TW (g)	Total (h= e+g)		
DCE-0602	Q.S.C.-II	3	1	2	6	70	22	20	100	30	09	20	50	150	3 Hour's

UNIT- I   **Marks : 14**

Estimate of R.C.C. Structure : Estimate of slab, beam, T-beam. Estimate of R.C.C. column with its footing. Preparation of Abstract of above items. Preparation of Bar bending schedule, and to calculate amount of steel.

UNIT- II   **Marks : 14**

Estimate of Steel / Timber Structures : Estimate of steel column (Stanchion) Estimate of steel Truss and Gusset Plate. Estimate of Roof covering materials.G.I. Roof, A.C. Roof. Estimate of steel frames for Doors & Windows. Estimate of Wooden Doors and Windows. Estimate of Roof Covering materials.

UNIT- III   **Marks : 14**

Estimate of Culverts & Bridges : Estimate of Hume pipe culvert with splayed type of wing wall, Turn wall, face wall. Estimate of R.C.C. slab bridge, straight type wing walls.

UNIT- IV   **Marks : 14**

Estimate of Water Supply and Sanitary Fittings : Detailed Estimate of Water Supply for building work. Detailed Estimate of Sanitary works for building work. Estimate of S.W. pipe line. Estimate of Septic Tank.

UNIT- V   **Marks : 14**

Valuation & Rent Fixation : Definition, Necessity of Valuation. Defination, Cost price,Value, Difference between them. Types of value, Book value, scrap value, salvage value, Market value, Depreciation, obsolescence, Sinking fund. Methods of calculation of depreciation, straight line method, sinking fund method constant percentage method, quantity survey method. Computation of capitalized value, Gross income, outgoing, net income, Years purchase. Types of outgoing and their percentages. Valuation of Lands & Buildings, factors affecting their valuation, Fixation of Rent as per PWD practice.

Text Books

1. Estimating & costing S.C. RangwalaCharotarPublication Anand

Reference Books

01 Estimating & costing in CivilEngineeringB.N. Datta UBS Publishers DistributorsPvt Ltd New Delhi

02 Estimating & costing,Specification and ValuationinCivil Engineering,M. Chakraborti M.Chakraborti ,Calcutta

03 Estimating & costing S.C. RangwalaCharotarPublication Anand

List of Assignments:

01. Use of different Schedule of Rates like .PWD.C.P.W.D. D.S.R.,RES, HOUSING BOARD ,IRRIGATION & PHE
02. Estimating & abstract and rate analysis with the help of different software eg. QE-PRO, ESTIMATOR, & Print out of report .
03. Taking out quantities of following items for small R.C.C. Hall
i) Concreting for footing, Column, Beam, slab.
ii) Reinforcement for above items by preparing Schedule of bars.
iii) Form work for all above items.
04. Preparing Rate analysis of following items: Building work – Brick work, P.C.C., R.C.C., Plastering, Flooring, Doors, Windows
05. Taking out quantities of Steel work for given shed supported on steel trusses & having GI sheet/profile sheet roofing.
06. Taking out quantities of work for pipe culvert. (Drawings shall be provided for the above exercises by subject teacher.)

Swami Vivekanand University, Sagar(M.P.)

DCE-0603 S.D.D.-II (Steel)

Paper code	Title of the Paper	Periods Per week				Distribution of Marks								Grand Total (i= d+h)	Duration of Exam
						Theory		MST (c)	Total (d = a+c)	Practical		TW (g)	Total (h= e+g)		
		L	T	P	C	Max (a)	Min (b)			Max (e)	Min (f)				
DCE-0603	S.D.D.-ll (Steel)	3	1	2	6	70	22	20	100	30	09	20	50	150	3 Hour's

UNIT- I   Marks : 14

Introduction :Types of sections used, Hollow Square section Rectangular section Tubular section, Z Section, Angle Section, T, I, C, L Section etc. Grades of steel and strength characteristics; advantages and disadvantages of steel as construction material; Use of steel table and relevant I. S. code; Types of loads on steel structure and its I. S. code specification.

UNIT- II   Marks : 14

Connections : Riveted connections, Types of rivets and their use, Nominal dia, Gross dia. Unwin's formula, Pitch of rivets, Edge distance, Tacking rivets, permissible stress in rivet riveted joint and its failure, Strength of riveted joint and efficiency of a riveted joint. Assumptions in theory of riveted joint, Design of riveted joint for axially loaded member. Eccentric riveted connection Welded connection Introduction, Permissible stress in weld, strength of weld, advantages and disadvantages of welded joint. Types of weld and their symbols. Design of fillet weld and butt weld subjected to axial load.

UNIT- III   Marks : 14

Tension member : Types of Sections used, Permissible Stresses in Axial Tension, gross and net cross sectional area of tension member, Analysis and design of tension member with welded and riveted connection. Compression Member :Criteria of failure of short column and long column , end conditions effective length of a column, slenderness ratio and corresponding compressive stress : Angle struts Types of sections used, Analysis and Design of axially loaded angle struts with welded and riveted connection. Stanchion and Columns, types of sections used, simple and built up sections. Analysis and design of axially loaded column.Design of compound column. Design of lacing angles and Batten plates

UNIT- IV   Marks : 14

Column Bases : Types of column bases ,design of slab base & concrete block. Cleat angles, their use, introduction to gusseted base (no numerical problems on gusseted Base)
Steel Beams : Different steel sections used; Simple and built-up sections Permissible bending stresses. Design of simple beams, check for shear only. Design of built-up beams (Symmetrical I Section with cover plates only), check for shear only, bending, bearing and deflection. Introduction to Plate Girder: Various components and their functions. (No numerical Problem on Plate Girder)

UNIT- V   Marks : 14

Roof Truss : Types of steel roof truss & its selection criteria. span and slope, Rise and pitch, loads acting on the Roof. Dead load; Live load and wind load as per I.S. 875-1987. Combination of loads for design of truss, Forces in the members (Graphical method). Design of members of truss, Design of Angle purlin as per I.S.06 16 .Arrangement of member.

Timber Structures : Grades of Timber – stress in timber. Factors affecting stress/ strength of timber. Design of Timber column & Timber Beam.

Text Books
1. Steel structures By Ramanatham
2. Structural Engg. Vol.-IV Steel)y Vazirani
3 Steel Structures By Ramchandra
4 Steel Structures By Arya and Ajmani
5 Steel Structures By Malhotra M.M.
6. I.S. Code 800-1984
7. Steel Structures By R.K. Dhoble & I.S. Dharmadhikari

Reference Books
1 Steel Structures By Ramchandra
2 Steel Structures By Arya and Ajmani
3 Steel Structures By Malhotra M.M.
4. I.S. Code 800-1984
5. Steel Structures By R.K. Dhoble & I.S. Dharmadhikari

List of Assignments:
PRACTICAL: Term work shall consists of sketch book and design report of steel roof truss for an industrial building. Sketch book shall consists of any five plates out of the below mentioned
1. Sketching of different types of riveted joints and welded joints.Typical sketches of sections of tension member, determination of net effective cross-sectional area of tension member for angle section.
2. Typical sketches of sections of compression member, lacing and battening.
3. Graphical solution of frames to find out the stress in the member. Type of trusses for different spans.
4. Working drawing of steel truss with the details of joint
5. Detailed drawing of slab base and gusseted base.
6. Important information of clauses of IS800-1984 and IS875 (Part-1,2 & 3)

Swami Vivekanand University, Sagar(M.P.)

DCE-0604 Project

Paper code	Title of the Paper	Periods Per week				Distribution of Marks									Grand Total (i= d+h)	Duration of Exam
						Theory		MST (c)	Total (d = a+c)	Practical		TW (g)	Total (h= e+g)			
		L	T	P	C	Max (a)	Min (b)			Max (e)	Min (f)					
DCE-0604	Project	-	-	10	10	-	-	-	-	200	100	50	250		250	3 Hour's