INSTITUTE OF ADVANCED STUDIES IN EDUCATION(DEEMED UNIVERSITY)
GANDHI VIDYA MANDIR
SARDARSHAHR

Detailed Syllabus

of

DIPLOMA IN CIVIL ENGINEERING

DIPLOMA IN CIVIL ENGINEERING

COURSE PERIOD:-3YEARS (SIX SEMESTER) **TOTAL MARKS- 3000**

FIRST SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
APPLIED MATHEMATICS-I	DCE-110	100	00	100
APPLIED PHYSICS	DCE-120 DCE-120P	50	50	100
APPLIED CHEMISTRY	DCE-130 DCE-130P	50	50	100
INTRODUCTION OF IT	DCE-140	100	00	100

SECOND SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
COMMUNICATION SKILLS-I	DCE-210 DCE-210P	50	50	100
APPLIED MATHEMATICS-II	DCE-220	100	00	100
APPLIED PHYSICE-II	DCE-230 DCE-230P	50	50	100
ENGINEERING DRAWING	DCE-240 DCS-240P	50	50	100
WORKSHOP PRACTICE-II	DCS-250P	00	100	100

THIRD SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
COMPUTER APPLICATION-I	DCE-310 DCE-310P	50	50	100
APPLIED MACHINES	DCE-320 DCE-320P	50	50	100
CONSTRUCTION MATERIALS	DCE-330 DCE-330P	50	50	100
BUILDING CONSTRUCTION	DCE-340	100	00	100
HYDRAULICS	DCE-350 DCE-350P	50	50	100

FOURTH SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
CIVIL ENGINEERING DRAWING –I	DCE-410	00	100	100
CONCREATE	DCE-420	50	50	100

TECHNOLOGY	**DCE-420P**			
STRUCTURAL MACHINES	**DCE-430** **DCE-430P**	**50**	**50**	**100**
SURVEYING-I	**DCE-440** **DCE-440P**	**50**	**50**	**100**
IRRIGATION ENGINEERING	**DCE-450P**	**00**	**100**	**100**

FIFTH SEMESTER

COURSE TITLE	**PAPER CODE**	**MARKS**		
		THEORY	**PRACTICAL**	**TOTAL**
CIVIL ENGINEERING DRWAING-II	**DCE-510P**	**00**	**100**	**100**
ELEMENTS OF RCC DESIGN	**DCE-520P**	**00**	**100**	**100**
TRANSPORATION ENGINEERING	**DCE-530**	**100**	**00**	**100**
SOIL & FOUNDATION ENGINEERING	**DCE-540** **DCE-540P**	**50**	**50**	**100**
SURVEYING-II CAMP	**DCE-550** **DCE-550P**	**50**	**50**	**100**

SIXTH SEMESTER

COURSE TITLE	**PAPER CODE**	**MARKS**		
		THEORY	**PRACTICAL**	**TOTAL**
EARTH QUAKE RESISTANT BUILDING CONSTRUCTION	**DCE-610** **DCE-610P**	**100**	**00**	**100**
ELEMENTS OF STEEL STRUCTURAL DESIGN	**DCE-620**	**100**	**00**	**100**
ESTIMATION & COSTING	**DCE-630**	**100**	**00**	**100**
CIVIL ENGINEERING DRAWING	**DCE-640** **DCE-640P**	**50**	**50**	**100**
PROJECT WORK	**DCE-650P**	**00**	**200**	**200**

Note:
Theory Paper: 30% Continuous Internal Assessment and 70 % University examination.
Practical Paper: 30 % Continuous Internal Assessment and 70 % University examination.

Continuous Internal Assessment:

1) Two or three tests out of which minimum Two will be considered for Assessment	**60% of Continuous Internal Assessment**
2) Seminars/Assignments/Quizzes	**30% of Continuous Internal Assessment**
3) Attendance, class participation And behavior	**10% of Continuous Internal Assessment**

SEMESTER-I

DCE-110 APPLIED MATHEMATICS-1

Maximum Time : 3 Hrs. **University Examination :70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will com prise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

1. AlGEBRA

Application of Quadratic equations simultaneous equations (one linear and other Quadratic equation) in two variables to engineering problems.

Arthmetic Progression, its nth term and sum of n terms with their applications to engineering problems. Geometrical Progression, its nth term and sum of n terms and to infinity with application to engineering problems.

Partial fractions (excluding repeated quadratic factors) formally introduction of permutations & combinations, applications of formulae for npr ncr

Binomial theorem (expansion without proof) for positive integral index (expansion and general term).

Binomial theorem for any index (expansion without proof only). First and second binomial approximation with application to engineering problems.

SECTION B

2. TRIGNOMETRY

Concept of angles, measurement of angles in degrees, grades and radians and their conversions. Trignometrical ratios and their relations.

Review of ratios of some standard angles (0,30,45,60,90 degrees), T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof).

Product formulae (Transformation of product to sum, difference and vice versa).T-Ratios of multiple angles, sub-multiple angles (2A, 3A, A/2).

Area of a triangle, Hero's formulae, solution of triangles with direct applications of cosine formulae, sine formulae, Napier's analogy only.

SECTION C

3. CO-ORDINATE GEOMETRY

Cartesian coordinates (two dimensions), Distance between two points, Internal and External division formulae, Application of area formulae (without proof).

Area of triangle when its vertices are given, coordinates of centroid, incentre of a triangle when the vertices are given, using the formulaes, simple problems on locus.

Application of equation of straight line in various standard forms, intersection of two straight lines, angle between two lines. Perpendicular distance formulae.

General equation of a circle and its characteristics. To find the equation of a circle given (i) Center and radius (ii) Three points on it (iii) Co-ordinates of end points of a diameter.

SECTION D

Plotting of curves y = (f(x), f(x) being algebraic function of x (maximum upto 2^{nd} degree).

Definition of conic section. Standard equation of parabola, To find equations of parabola when its focus and directrix are given, Given the equation of a parabola, determination of its focus, vertex axis, directrix and lactus rectum.

Ellipse and hyberbola (standard equations without proof), given the equation in the standard form , determination of focus , directrix , lactus rectum. Axes, eccentricity and center.

Concept of Polar coordinates & their conversion to Cartesian coordinates & vice versa, cylinder,cone,3D

DCE-120 APPLIED PHYSICS-I

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

MECHANICS

1. UNITS AND DIMENSIONS

Fundamental and derived units in SI System**,**
Dimensions of Physical Quantitites,
Principle of homogeneity
Dimensional equation,
Applications of dimensional analysis: Checking the correctness of physical equations, Derivation of simple physical relations, Limitation of Dimensional Analysis, significant figures and Error Analysis.

2. FORCE AND MOTION

Scalars and Vectors,
Velocity & acceleration,
Equations of motion,
Newton's law of motion,
Force & its derivation from Newton's laws of motion,
Composition and resolution of forces,
Parabolic Motion
Horizontal projection and projection at an angle, time of flight,
Horizontal range and maximum horizontal range,
Simple Problems,
Centripetal acceleration, centripetal and centrifugal forces,
Concept of friction and its application.
Application to banking of roads

SECTION B

3. WORK, POWER AND ENERGY

Work and its Units,
Work done on bodies moving on horizontal and inclined planes (consider frictional forces also).
Concept of Power and its units,
Calculations of power (simple cases).
Concept of Kinetic energy and potential energy
Expressions for P.E and K.E,
Conservation of energy in the case of freely falling bodies,
Principle of conservation of energy.

4. ROTATIONAL AND SIMPLE HARMONIC MOTIONS

Definition of moment of inertia,
Moment of inertia of disc, ring & sphere,
Torque and angular momentum and their inter relation,
Principles of conservation (angular momentum and its applications).
Kinetic energy of rolling body,
S.H.M – derivation of displacement, velocity, acceleration, time period and frequency,
Motion of cantilever, Free, forced and resonant vibrations (No derivation).

SECTION C

HEAT

1. TEMPERATURE AND ITS MEASUREMENT
Concept of heat and temperature on the basis of K.E. of molecules.
Unit of heat
Basic Principles of measurement of temperature,
Thermocouple,
Bimetallic and resistance,
Pyrometers and Thermometers
Criteria for the selection of thermometers.

2. EXPANSION OF SOLIDS

Coefficient of linear,
Surface and cubical expansions and relation amongst them,
Thermal stresses (qualitative only) and their applications.

SECTION D

3. HEAT TRANSFER

Three modes of transfer of heat,
Coefficient of thermal conductivity, its determination by Searle's method and Lee's disc method.
Conduction through compound media (Series and parallel for two materials only),
Heat radiation, Characteristics of heat radiations,
Prevost's theory of heat exchange,
Black body radiations,
Emissivity and absorbtivity
Kirchoff's law and stefan's law of radiation.

DCE-120P APPLIED PHYSICS-I

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. To determine the density of a cylinder using vernier calipers and balance.
2. To determine area of cross section of wire using screw guage.
3. To determine the thickness of glass piece using spherometer.
4. Calculation and verfication of period of vibration of a cantilever (use graph)
5. Verify Parallelogram law of forces.
6. Measurement of K.E. gained by a body dropped through height h.
7. To find the coefficient of linear expression of given rod.
8. Caliberation of Thermocouple.

DCE-130 APPLIED CHEMISTRY-I

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. STRUCTURE OF ATOM

Chemistry as important branch of science, Basic concept of Elements Mixture and compound, Chemical Equation, its balancing , implications and limitations.
Recapitulation of Fundamental Particles of atom i.e electron. Proton and neutron.
Bohr's model of atom
Line Spectrum of Hydrogen
Modern concept of atom-four quantum numbers, shells,subshells, orbital (shapes of s & p orbitals
Pauli's exclusion principle.
Afbau Energy ranking rule.
Orbital concept types of bonds co-valency, formation of s-s, s-p, p-p, bonding with examples.
Hybridization sp, sp2, sp3, (consider BeF2, BF3, CH4) molecules.
Brief concept of modern periodic table of elements.

SECTION B

2. CHEMICAL EQUATION, OXIDATION & REDUCTION

Concept of Oxidation & Reduction.
Electronic concept of oxidation and reduction.
Redox reactions (direct and indirect).
Oxidation No. balancing of simple redox reactions by oxidation No.

SECTION C

3. IONIC EQUILIBIRIUM

Ionization., degree of ionization,
Focus effecting ionization

Ionization of water, ionization equilibrium in aqueous solutions, common ion effect

4. ACIDS AND BASES
Concept of acids and bases, their strength in ionization constant.
PH value, acid base titration, choice of indicators.
Hydrolysis
Buffer solution

5. ELECTROLYSIS
Concept of electrolysis.
Faraday's law of electrolysis.
Engineering applications (electro-metallurgy, electroplating & electro-refining)

SECTION D

6. WATER
Hard and soft water, removal of hardness by :
a. Soda lime process.
b. Permutit's process.
c. Ion exchange method.
Disadvantages of hard water in industrial use, boiler scales, priming, foaming corrosion and
caustic embrittlement.
Expressing the degree of hardness of water in (with simple problems)
a. Clark's degree
b. O'Hener;s method
Determination of degree of hardness by (with simple problems) :
a. Soap titration method :
b. O'Hener's method :
Water for drinking purposes .

7. SOLUTIONS & COLLOIDS
Solute, solvent, solution & colloids.
Particle size and colloidal state
Tyndell effect, Brownian movement , coagulation.

DCE-130P APPLIED CHEMISTRY-I

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. Introduction of basic concepts of volumetric analysis & other related equipment.
2. Find the strength in grams per litre of the given solution or sodium hydroxide with the help of standard oxalic acid solution.
3. Find the strength of sulphuric acid in grams per litre using standard oxalic acid solution and an intermediate alkali solution indicator phenopthalein.
4. Determine the strength of oxalic acid solution in grams per litre using standard sulphuric acid , Indicator methyl orange.
5. Determine the total alkalinity in ppm in the given sample of water by soap solution method.
6. Estimate the total hardness of a sample of water by soap solution method.
7. Estimate the amount of chlorides present in water using silver nitrate solution. Indicator potassium chromate.
8. Determine percentage purity of commercial samples like blue vitrol and green vitrol volumetrically.
9. Qualitative analysis of some important acidic & basic radicals with direct testing with demonstration of group analysis.

DCE-140 INTRODUCTION TO IT

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

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2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

information concepts & processing

definition of information, data Vs information, introduction to information system, information representation digital media, images, graphics, animation, audio, video etc. Need a value & quality of information the concept of information entropy & numericals.

SECTION B

Computer appreciation

definition of electronic computer, history, generation, characteristics & application of computers, classification of computers, RAM,ROM, computer hardware, CPU, various I/O devices, peripherals , storage media, software definition and concepts.

SECTION C

Data communication & networks

computer networks , networking of computers, introduction to LAN, WAN, MAN, network topologies , basic concepts in computers computer networks, introduction to GPRS, CDMA,GSM & FM technologies.

SECTION D

Introduction to internet technologies

HTML, DHTML,WWW,FTP, TELENET, web browser, net surfing , search engines, e-mail, ISP, e-commerce, public key, private key, safety of business transaction on web.

Concepts in operation system

Elementary concepts in operation system, GUI, introduction to DOS, MS windows,

SEMESTER-II

DCE-210 COMMUNICATION SKILLS-1

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Corresponding : (Official, Business And Personal)

? One Letter from each category (Official, Business and Personal) may be set in the examination paper and the students be asked to write one of them.

SECTION B

2. Grammar

? A brief review of easy form of tenses. Conversion of direct narration into indirect form of narration and vice versa (only simple sentences). Punctuation.

SECTION C

3. Essay

? Preferably on scientific topic from the given outlines. The paper setter may be instructed to give a choice of attempting one out of three topics. The question paper may provide the outlines. The essay will be of 250 to 300 words. The examiner may select three topics one from each of the following.

(i) Science
(ii) Technology
(iii) General.

SECTION D

Written Communication

report, notices, agenda notes, business correspondence preparation of summery & prices.

DCE-210P COMMUNICATION SKILLS-1

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1 Locate a particular book in the library.
2 Find out some words in the dictionary.
3 Prounciation, stress and intonation.
4. Give abbreviations of particular words and vice versa
5. Give meaning of some words.
6. Spell some words.
7. Practice of handling some communication systems like telephone and noting down and conveying messages.

DCE-220 APPLIED MATHEMATICS-II

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Differential Calculus

Concept of limits. Four standard limits $\lim_{x \to a} \frac{x^n - a^n}{x - a}$

$\lim_{x \to 0} \frac{\sin x}{x}$ $\lim_{x \to 0} \frac{a^x - 1}{x}$ $\lim_{x \to 0} (1+x)^{1/x}$

Differentiation by definition of x^n, sinx, cos x, tan x, e^x
Differentiation of sum, product and quotient of functions. Differentiation of function as a function.

Differentiation of trigonometric inverse functions. Logarithmic differentiation,
Successive differentiation (excluding nth order)
Applications :
(a) Rate Measures
(b) Errors
(c) Maxima and Minima
(d) Equation of tangent to a curve for explicit functions only and equation of a normal.
(e) Newton's Method of solving equation using the formula f(a) /f'(a)

SECTION B

2. Integral Calculus

Integration as inverse operation of differentiation.
Simple Integration by substitution, by parts and by partial fractions (for linear factors only).
Evaluation of definite integrals (simple problems)-

Evaluation of $\int_0^{pi/2} \text{Sin}^n x \, dx$ $\int_0^{pi/2} \text{Cos}^n x \, dx$ $\int_0^{pi/2} \text{Sin}^m x \, \text{Cos}^n x$

using formulae without proof (m and n being positive integers only)

Applications :

(a) area bounded by a curve and axes
(b) volume of solid formed by revolution of an area about axes. (Simple problems).
(c) Centre of gravity
(d) Moment of Inertia
(e) Average value
(f) Root mean square value of a function
(g) gama function(reduction formula)

SECTION C

3. Differential Equation

Concept of formation of Differential Equation and solution of first order differential equation.
(a) Variables separation.
(b) Homogeneous differential Equation
(c) Linear Differential Equation. ax n

Solution of Linear differential Equations having e , Sin ax, Cos ax and x in the right hand side.

SECTION D

matrix

addition, subtraction, multification, rank of matrix

DCE-230 APPLIED PHYSICS-II

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Waves

Generation of waves by vibrating particles, wave motion and its parameters.
Equating a wave. Energy transfer by particle and wave.
Superposition of waves and interference (graphical).
Sound and light as waves-frequencies, wavelength and velocities and their relationship.

SECTION B

2. Applications of Sound

Ultrasonics

(a) Production of ultrasonic waves by using magneto-striction and piezo – electric methods.
(b) Applications to drilling cold welding, cleaning, flaw detection and exploration (Sonar).

Acoustics

(a) Reflection, refraction and absorption of sound waves by surfaces.
(b) Echo and reverbration.

3. Applications of Light

Refraction and refractive index.
Defects in image formation (Qualitative), Simple and compound microscope, astronomical and Galaleo telescopes and their magnifying powers.

4. Electrostatics

Coloumb's law, Unit charge
Electric field and Electric lines of force.
Electric intensity due to charged straight conductor and plane sheet.
Capacitance and its units, Parallel plate capacitor.
Grouping of capacitors in series and parallel (simple problems).
Dielectric constant - its functions.

SECTION C

5. D.C. Circuits

Ohm's law
Kirchoff's law
Wheatstone Bridge Principle.
Simple Problems on series and parallel circuits.

SECTION D

6. Electromagnetism

Magnetic fields and its units.
Magnetic field around a current carrying conductor.
Circular loop and solenoids.
Force on a moving charge and current in a magnetic field.
Force between two current carrying parallel conductors.
Moving coil galvanometer; Conversion of galvanometer into Ammeter and Voltmeter.
Permeability; Dia, para and Ferro magnetic materials.

7. Modern Physics

Introduction to laser, its characteristics and important applications.
Introduction to common modes of communication, viz Fax, E-mail, Internet etc.

DCE-230P APPLIED PHYSICS-II

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. To find the velocity of sound by resonance method.
2. Determine the focal length of a convex lens by displacement method.
3. Setting up a model of telescope and determination of its magnifying power.
4. Setting up a model of compound microscope and determination of its magnifying power.

DCE-240P ENGINEERING DRAWING-I

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

SECTION A

1. Handling Use and Care of Drawing instruments and Materials.

Drawing Instruments
Materials
Layout of Drawing sheets

SECTION B

2. Free Hand Sketching and Lettering

Different types of lines in Engineering drawing as per ISI specifications.
Practice of free hand sketching of vertical, horizontal and inclined lines, geometrical figures such as triangles, rectangles and circles.

3. Lettering Technique and Practice

Intsrumental single stroke lettering of 35 mm and 70 mm height in the ratio of 7:4 Free hand Lettering (Alphabet and numerals)- lower case and upper case, single stroke and block letters, verical and inclined at 75 degree in different standards, series of 3:5 8 and 12 mm heights in the ratio of 7:4

4. Dimensioning Technique

Necessity of dimensioning , method and principles of dimensioning (mainly theoretical instructions).
Dimensioning of Overall sizes, circles, threaded holes, chamfered surfaces, angles, tapered surfaces, holes, equally spaced on P.C.D., counter sink holes, counter bored holes, cylindrical parts, narrow spaces and gaps, radii, curves and arches.

DCE-240 ENGINEERING DRAWING

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Scales

Scales – their need and importance –(Theoritical instructions).
Drawing of plain and diagonal scales.

SECTION B

2. Projection

Theory of projections (Elaborate theoretical instructions)
Drawing 3 views of given objects (Non symmetrical objects may be selected for this exercise).
Drawing 6 views of given objects (Non symmetrical objects may be selected for this exercise).
Identification of surfaces on drawn views and objects drawn.
Exercises on missing surfaces and views.
Orthographic drawing or interpretation of views.
Introduction to third angle projections.

SECTION C

3. Sections

Importance and salient features, Methods of representing sections, conventional sections of various materials, classification of sections, conventional in sectioning.
Drawing of full section, half section, partial or broken out sections, offset sections, revolved sections and removed sections.
Drawing of different conventions for materials in section, conventional breaks for shafts, pipes, rectangular, square angle, channel, rolled sections.
Exercises on sectional views of different objects.

SECTION D

4. Isometric Views

Fundamentals of isometric projections (Theoretical Projections)
Isometric views from 2 to 3 given orthographic views.
Preparation of simple working draw ing of Furniture items like table, stool and any job prepared in the workshop.

DCE-250P WORKSHOP PRACTICE-II

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

The following shops are included in the syllabus : Student can opt relevant shops depending upon the need of his/her course :
1. Carpentry and painting shop.
2. Fitting shop.
3. Welding & sheet metal shop.
4. Electric shop.
5. Smithy or electronic shop.

SECTION A

1. Carpentary and Painting shop

Introduction to joints, their relative advantages and uses.
Job I - Preparation of Dovetail joint.
Job II - Preparation of Mitre joint.
Job III - Preparation of lengthening joint.
Job IV - Preparation of atleast one uti;ity job with and without lamination.
Demonstration of job showing use of Rip saw, Bow saw and Tramme, method of sharpening various saws.
Demonstration of job on Band Saw and Circular saw, chain & diesel universal wood working machine, saw resharpening machine, Saw Brazing unit.
Demonstration of various methods of painting various items.
Job V- Preparation of surface before painting.
Job VI – Application of primer coal
Job VII – Painting wooden items by brush/roller/spray

SECTION B

2. Fitting Shop

Description and demonstration of various types of drills, taps and dies
Selection of dies for tapping, Types of taps, tapping, dieing and drilling operations.
Job I – Making Internal and External Threads on a job by taping and dieing operations (manually).
Precautions while drilling soft materials, specially lead.
Job II- Drilling practice on soft metals (Aluminium, Brass and lead)
Care and maintenance of measuring tools like calipers, steel rule, try square, vernier micrometer, height gauge , combination set , reading gauge, Handling measuring instruments, checking of zero error, finding of least count.
Job III - Preparation of a job by filling on non-ferrous metal.
Job IV - Production of a utility job involving all the operations.
different types of elbow T- Union, Socket, stopstock, taps etc.
Job V - Preparation of job involving thread on GI pipe / PVC pipe and fixing of different types of elbow T-Union, socket, stopstock,taps
Description and demonstration of various ypes of drills, taps and dies; Selection of dies for tapping; Types of taps, Tapping and dieing operations.

SECTION C

3. Welding Shop

? Introduction of the gas welding, gas welding equipment, adjustments of different types of flames, demonstration and precautions about handling welding equipment.
Job I - Practice in handling gas welding equipment and welding practice.
Common welding joints generally made by gas welding.
Job II - Preparation of Butt joint by gas welding.
Job III – Preparation of small cot conduit pipe frame by electric arc welding / gas welding.
Job IV- Preparation of square pyramid from M.S Rods by welding (type of welding to be decided by students themselves).
Job V- Exercise job on spot/seam welding machine.
Demonstration of various methods adopted for painting steel items.
Job VI - Painting steel items by brush/roller/spray.

SECTION D

4. Electric Shop

Importance of three phase wiring and its effectiveness.

Job I - Laying out of 3 phase wiring for an electric motor or any other 3 phase machine .

Estimating and costing power consumption.

Job II - Connecting single phase energy meter and testing it. Reading and working out the power consumption and the cost of energy.

Job III - Checking continuity of connection (with tester and bulbs) location of faults with a 00multimeter and their rectification in simple machines and/or/other electric circuits filled with earthing.

Demonstration of dismantling, servicing and reassembling a table fan/air cooler/mixer/electric iron, Electric Heater, geaser, electric oven.

Job IV - To forge a ring to acquaint the students with forge welding.

Job V - To prepare a trus joint of MS angle iron.

Job VI - To forge a chisel and acquaint the students with simple idea of hardening and tempering.

Forge Welding, defects in forging and inspection.

Job IV - To forge squares on both ends of a circular rod with the elp of power hammer.

Job V - Fullering of a given mild steel flat.

Job VI - Production of a utility job.

OR

5. Electronic Shop

Demonstrate (or explain) the joining (or connecting) methods or/and mounting and dismantling method as well as uses of the items mentioned below:

a) Various types of single, multi-cored insulated screened pour, Audio video, general purpose wires/cables.
b) Various types of plugs, sockets connectors suitable for general purpose audio video use. Some of such connectors area: 2 and 3 pin mains plug and sockets.
   Banana-plugs, and sockets, BNG, RCA, DIN, UHF, Ear phone speaker connector,
   Telephone jacks and similar male and female connectors and terminal strips.
c) Various types of switches such as normal/ miniature toggle, slide, push button plano key, rotatory, SPST, SPDT, DPST, DPDT,
d) Various types of protective devices such as: Wire fuse, cartridge fuse, slow acting/ fast acting fuse, HRC fuse, thermal fuse, single/multiple miniature circuit beakers, over and current relays.

Demonstrate the skill to make facilities solder joints.

Demonstrate the skill to remove components/wires by unsoldering

Demonstrate the skill to assemble components on borads, chassis, tape strips

Explain (or demonstrate) various methods of making and laying of cable forms,
wiring techniwues

Exposure to modern soldering and desoldering processes.

Field visits

Job I - Desolder, remove and clean all the components, wires from a given equipment
APCB or a tip strip

Job II- Soldering iron

Job III- Temperature Control soldering iron

Job IV- Desoldering strip.

SEMESTER-III

DCE-310 COMPUTER APPLICATIONS-I

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Familiarization With Operating System

Introduction to computer Operating System (Dos, Windows'95).
Introduction to Dos structure, system files, batch files & configuration files.
Booting the system from floppy & hard disk.
Brief Introduction to Dos internal & external commands.
Familiarisation with windows structures, its use and application.

SECTION B

2. Preparation of Documents Through Word Processing .

Idea of text editors like Microsoft word, write etc.
Opening a document.
Preparing documents, inserting diagrams & tables.
Editing document.
(a) Character, word and Line Editing.
(b) Margin Setting, Paragraph alignment.
(c) Block Operations.
(d) Spell Checker
(e) Saving a document.

SECTION C

3. Information Presentation For Decision Making Using Spread Sheet : (Excel/Lotus 1 -2-3)

Applications of spread sheet.
Structure of spread sheet.
Preparing spread sheet for simple data and numeric operations.
Using formulae in spread sheet operations.
Making Tables, sorting and querying.

Creation of graphs, Pie charts, bar charts.
Printing reports.

SECTION D
4. Computer aided Drafting (CAD)
Making simple drawings using features of CAD and confirming the drafting spacifications.
Saving and retrieving drawings.
Dimensioning.
Lettering.
Plotted drawing

DCE-310P COMPUTER APPLICATIONS-I

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

Simple exercises based upon theory syllabus.

DCE-320 APPLIED MECHANICS

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A
1. Introduction
Concept of mechanics and applied mechanics- Explanation of Mechanics and applied Mechanics, its importance and necessity, giving suitable examples on bodies at rest and in motion, explanation of branches of this subject. Concept of rigid bodies.

SECTION B
2. Laws of Forces
Force and its effects, units and measurement of force, characteristics of force vector representation, Bow's notation, Types of forces, action and reaction, tension, thrust and

shear force. Force systems : Coplaner and space force systems. Coplaner concurrent and non-concurrent forces. Free body diagrams, Resultant and components concept of equlibirium ; Parallelogram law of forces. Equilibirium of two forces, superposition and transmissibility of forces, Newton's third law, triangle of forces, different cases of concurrent coplanar, two force systems, extension of parallelogram law and triangle law to many forces acting at one point-polygon law of forces, method of resolution into orthogonal components for finding the resultant, graphical methods, special case of three concurrent, coplanar forces, Lami's theorem.

3. Moments

Concept of moment, Varignon's theorem – statement only. Principle of moments – application of moments to simple mechanism, parallel forces, calculation of their resultant, concept of couple properties and effect, moving a force parallel to its line of action, general cases of coplanar force system, general conditions of equilibirium of bodies under coplanar forces.

4. Friction

Concept of friction, laws of friction, limiting friction and coefficient of friction, sliding friction.

SECTION C

5. Centre of Gravity

Concept of gravity, gravitational force, centroid and center of gravity, centroid for regular lamina and center of gravity for regular solids. Position of center of gravity of compound bodies and centroid of composition area. CG of bodies with portions removed.

SECTION D

6. Laws of Motion

Concept of momentum, Newton's laws of motion, their application, derivation of force equation from second law of motion, numerical problems on second law of motion, piles, lifts, bodies tied with string. Newton's third law of motion and numerical problems based on it, conservation of momentum, impulsive force
(definition only).

7. Simple Machines.

Concept of machine, mechanical advantage,velocity ratio and efficiency of a machine their relationship, law of machine, simple machines (lever, wheel and axle, pulleys, jacks winch crabs only).

DCE-320P APPLIED MECHANICS

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. Verification of the laws of polygon of forces.
2. To verify the forces in the different members of a jib crane.
3. To verify the reaction in the supports of a simple supported beam.
4. To find the mechanical advantage, velocity ratio and efficiency in the case of inclined Planes.
5. To find the mechanical advantage, velocity ratio and efficiency in the case of Screw Jack.
6. To find the mechanical advantage, velocity ratio and efficiency in the case of Worm and Worm Wheel.
7. To find the mechanical advantage, velocity ratio and efficiency in the case of Winch Crab-Single Graphical Representation.
8. To find out center of gravity of regular laminas.
9. To find out center of gravity of irregular laminas.
10. To determine coefficient of friction between 3 pairs of given surfaces.
11. To determine personal horse power of the experimenter.

DCE-330 CONSTRUCTION MATERIALS

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Building Stones

Classification of Rocks: (Brief review only)
Geological classification: Igneous, sedimentary and metamorphic rocks.
Chemical classification: Calcareous, argillaceous and siliceous rocks.
Physical classification: Unstratified, stratified and foliated rocks.
General characteristics of stones.

Requirments of good building stones and their testing.
Identifications of common building stones.
Various uses of stones in construction.

2. Bricks and Tiles

Introduction to bricks.
Raw materials for manufacturing and properties of good brick making earth.
Manufacturing of bricks

(i) Preparation of clay (manual/mechanically).
(ii) Moulding: hand moulding and machine moulding, drying of bricks, burning of bricks, types of Kilns (Bull's Trench Kiln; traditional brick, refractory brick, clay - flyash bricks, sundried bricks.

Classification of bricks as per BIS:1077
Size of brick-IS specifications, commercial sizes.
Testing of common building bricks as per BIS: 3495
Compressive strength, water absorption, efflorescence, dimensional tolerance test.
Special bricks.
(i) Building tiles: Types of tiles-wall, ceiling, roofing and flooring tiles
(ii) Ceramic tiles, their properties and uses.
Stacking of bricks and tiles at site.

3. Cement

Introduction, raw materials, manufacture of ordinary Portland cement, flow diagram for wet and dry process.
Properties and uses of ordinary portland cement.
Testing of cement as per BIS: Strength of cement, fineness by sieving, consistenecy, soundness, setting times.
Special Cements and their uses.
Storage of Cement.

SECTION B

4. Lime

Introduction: Lime as one of the following materials.
Natural sources for the manufacture of lime.
Definition of terms: quick lime, fat lime, hydraulic lime, hydrated lime, lump line.
Calcination and slaking of lime.
IS classification of lime.
Testing of lime.

5. Timber and Wood Based Products

Classification of trees: Exogeneous and Endogeneous trees, cross-section of an exogenous tree and explanation of various terms.
Identification of various types of timber: Teak, Deodar, Shisham, Sal, Mango, Kail and Chir.
Market forms of converted timber as per BIS.
Seasoning of timber: Purpose, methods of seasoning, Kiln seasoning as per BIS.
Defects in timber, decay in timber.
Preservation of timber and methods of treatment as per BIS.
Properties of timber and specifications of stuctural timber.
Common structural timbers in India, their availability and uses-Teak, Deodar,
Shisham, Sal, Mango, Kail and Chir.
Plywood; Veneers and veneering, manufacturing plywood (brief description only), uses of plywood.
Other wood based products, their brief description of manufacture and uses;

laminated board, block board, fibre board, hard board and gypsum board, applications of boards in false ceiling and wall paneling.

SECTION C

6. Paints and Varnishes

Purpose and uses of paints.

Different types of paints: oil paints, water paints, cement paints and plastic paints.

(i) Oil paints: Constituents of an oil paint, raw materials used for different constituents of oil paints and their properties, preparation of an oil paint, characteristics of a good oil paint. Application on wood and metal surfaces.

(ii) Cement paints- commonly available cement paints, their properties and uses. Application of cement paints

(iii) Water paint, Plastic paints and their uses.

(iv) Varnishes and polish-types, properties and their uses.

(v) Lacquers and enamels -their properties and their uses.

SECTION D

7. Metals

Ferrous Metals: Composition, properties and uses of cast iron, steel (mild and high tension steel), requirements of mild steel as per BIS.

Non Ferrous Metals: properties and uses of the following non ferrous metals in Civil Engineering works -copper, lead, zinc, tin and aluminium.

Commercial forms of ferrous and non ferrous metals.

8. Miscellaneous Materials

Plastics: Important commercial products of plastics used in Civil Engineering Construction.

Asbestos based products: Commercial forms and their uses.

Insulating materials for Sound and Thermal Ins ulation

Geotextiles.

Construction chemicals like: water proofing compounds epoxies, sulphides, polymers.

Glass: Types of glasses, their properties. Commercial forms and uses: plate glass, wired glass, bullet resisting glass, coloured glass, fibre glass, foamed glass wool, float glass, glass reinforced plastic.

Water proffing materials; Bitumen sheets and felts, chemical admixtures

Composite materials.

Note: - A field visit may be planned to explain and show the relevant things

DCE-330P CONSTRUCTION MATERIALS

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. To physically identify different types of stones.
2. To determine the crushing strength of stones.
3. To determine the water absorption of bricks.
4. To conduct dimensional tolerance test on bricks.
5. To conduct field tests on cement.
6. To determine fineness (by sieve method) of cement.
7. To determine normal consistency of cement.
8. To determine initial and final setting times of cement.
9. To determine soundness of cement.
10. To determine compressive strength of cement.
11. To identify various types of timbers such as: Teak, Sal, Chir, Sisso, Deodar, Kail, Mango etc.

DCE-340 BUILDING CONSTRUCTION

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Introduction

Definition of a building, classification of buildings based on occupancy, requirements of a good residential building.

Different parts of a building.

2. Foundations

Excavation in ordinary and hard soils, excavation in soft and hard rock, excavation in weak soils.

Concept of foundation and its purpose

(i) Types of foundations-shallow and deep

(ii) Shallow foundation – constructional details of : Spread foundations for walls, thumb rules for depth and width of foundation and thickness of concrete block, stepped foundation, masonary pillars and concrete coloumns. Raft foundation, combined footing, grillage foundation.
(iii) Construction-preparing foundation plans, setting out, ecxcavation and timbering.

3. Brick Masonry

Definition of terms: mortar, bond, facing, backing, hearting, column, pillar, plinth, plinth masonry, header stretcher, bed of brick, bat, queen closer, king closer, frog and quoin Bond-meaning and necessity: English bond only:1, 1-1/2 and 2 Brick thick walls in English Bond, T, X and right angled corner junctions. Thickness for 1, 1-1/2 and 2 brick square pillars in English Bond.
Construction of Brick walls - Method of having bricks in walls, precautions observed in the construction of walls, method of bonding new brick work with old (Toothing, raking back and block bonding)

Principles and precautions to be observed in brick masonry
Classification of brick masonry

4. Stone Masonry

Glossary of terms-Natural bed, bedding planes, string course, corbel, cornice, block incourse, grouting, mouldings, template, throating, through stones, parapet, coping, pilaster and buttress.
Types of Stone Masonry: Rubble Masonry: random and coarsed. Ashlar Masonry: Ashlar fine, Ashlar rough, Ashlar facing, specifications for coarsed rubble masonry, principles to be observed in construction of stone masonary walls

SECTION B

5. Walls

Purpose of walls
Classification of walls-load bearing, dwarf, retaining, breast walls and dhaji walls partition walls, cavity walls, composite masonary walls.
Classification of walls as per materials of construction: brick stone, reinforced brick, reinforced concrete, precast, hollow and solid concrete block and composite, masonary walls.
Factor affecting thickness of walls,
Partition walls, constructional details, suitability and uses of brick and wooden partition walls.

6. Mortars and Concretes

Preparation, use, average strength and suitability of cement, lime, lime cement, lime surkhi, mud mortar, Ingrdient of concrete, advantages of concrete, types and uses of concrete

7. Form Work and Scaffolding

Constructional details and suitability of mason's brick layers and tubular scaffolding. Form work for columns, walls, beams and slabs. Strutting and shoring and underpinning types and uses.

8. Damp Proofing

Dampness and its ill effects on bricks, plaster, wooden fixtures, metal fixtures and reinforcement, damage to asthetic appearance, damage to heat insulating materials, damage to stored articles and health, sources and causes of dampness
Types of dampness-moisture penetrating the building from outside e.g. rain water, surface water, ground moisture

Moisture entrapped during construction i.e. moisture in concrete, masonry construction and plastering work etc.
Moisture which originates in the building itself i.e. water in kitchen and bath rooms etc.
Damp proofing materials and their specifications: rich concrete and mortar, bitumen, bitumen mastic.
Methods of damp proofing basement, ground floors, plinth and walls, special damp proofing arrangements in bathrooms, WC and Kitchen, damp proofing for roofs and window sills.
Plinth protection and aprons.

SECTION C

9. Arches and Lintels

Meaning and use of arches and lintels.
Glossary of terms used in arches and lintels-Abutment, arch ring, intrados, soffit extrados, voussoiers, springer, springing line, crown, key stone, skew back, span, rise, depth of an arch, haunch, spandril, bearing, thickness of lintel, effective span
Arches
(i) Types of Arches-Semi circular, segmental, elliptivcal and parabolic, flat, inverted and relieving
(ii) Stone arches and their construction
(iii) Brick arches and their construction

10. Doors and Windows

Glossary of terms used in doors and windows.
Doors-name, uses and sketches of metal doors, ledged and battened doors, ledged doors, collapsible doors, rolling steel shutters, side sliding doors, door frames, PVC shutters and metal doors.
Windows-names, uses and sketches of metal windows, fully paneled windows, fully glazed windows, casement windows, fanlight windows and ventilators, sky light window rames, louvered shutters (emphasis shall be given for using metals and plastics etc. in piece of timber)

11. Roofs

Types of Roofs, concept of flat, pitched, hiped, arched and cell roofs
Glossary of terms for pitched roofs-batten, eaves, barge, facia board, gable hip-lap, purlin, rafter, rag bolt, valley, ridge
Drainage arrangement for pitched roofs
Drainage arrangement for flat roofs

12. Floors

Ground floors
Glossary of terms-floor finish, topping, under layer, base course, rubble filling and their purpose
Types of floor finishes-cast-in-situ, concrete flooring (monolithic, bonded) Terrazo tile flooring, cast-in-situ, Terrazo flooring, Timber flooring, floor polishing equipment PVC floor, ceramic floor
Upper floors
Flooring on RCC Slab
Flooring on RB Slab

SECTION D

13. Stairs

Glossary of terms: Stair case, winders, landing, stringer, newel baluster, riser, tread, width of staircase, hand rail, nosing
Planning and layout of staircase: Relations between rise and going, determination of width of stair, landing etc.
Various types of layout-straight flight, dog ledgged, open wall, quarter turn. Half turn (new and geometrical stairs), bifurcated stair, spiral stair.
Requirements of good stairs.

14. Surface Finishes

Plastering - classification according to use and finishes like grit finish, rough cast, pebble dashed plain plaster etc., dubbling, proportion of mortars used for different plasters, reparation of mortars, techniques of plastering and curing.
Pointing-different types of pointing, mortar used and method for printing.
Painting-application of paints on wooden, steel and plastered wall surfaces.
White washing, colour washing and distempering, application of cement and plastic paints.
Commonly used water repellant for exterior surfaces, their names and application.

15. Building Planning

Site selection: Factors to be considered for selection of site for residential, commercial, industrial and public building.
Basic principles of building planning, arrangement of doors, windows, cupboards, etc. for residential building.
Orientation of building as per BIS: 7662 relation to sun and wind direction, rains, internal circulation and placement of rooms within the available area.

Note: - An expert may be invited from field/industry for extension lecture
- A field visit may be planned to explain and show the relevant things

DCE-350P BUILDING CONSTRUCTION

Maximum Time :3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. Demonstration of tools and plants used in building construction.
2. Layout of a building.
3. To construct brick bonds (English bond only) in one, one and half and two brick thick:
(a) Walls for L. T and cross junction
(b) Columns
4. Visit to construction site for showing the following items of works and to write specific report about the works seen.
(a) Timbering of excavated trenching
(b) Damp roof courses
(c) Construction of masonry walls
(d) Flooring: Laying of flooring on an already prepared lime concrete base
(e) Plastering and pointing.
(f) White and colour washing
(g) Use of special type of shuttering/heavy machines in construction work

DCE-350 HYDRAULICS

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Introduction

Fluid: Real fluid, ideal fluid

Fluid Mechanics, hydraulics, hydrostatics, hydrokinematics and hydrodynamics

2. Properties of Fluids:

Mass density, specific weight, specific gravity, cohesion, adhesion, viscosity, surface tension, capillary, vapour pressure and compressibility.

Units of measurement

SECTION B

3. Hydrostatic pressure

Pressure, intensity of pressure, pressure head, pascal's law and its applications.

Total pressure, resultant pressure, and center of pressure.

Total pressure and center of pressure on vertical and inclined plane surfaces:

Rectangular, triangular, trapezoidal,circular.

Total pressure on dams and lock gates.

4. Measurement of Pressure

Atmospheric pressure, gauge pressure, vaccum pressure and absolute pressure.

Piezometers, simple manometer, different manometer and mecha nical gauges.

Measurement of pressure by manometers and pressure gauges.

SECTION C

5. Fundamentals 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 theorem).

6. Orifice

Definition of Orifice, and types of orifices.

Hydraulic coefficients.

Large vertical orifices and small orifices.
Free, drowned and partially drowned orifice.
Time of emptying a rectangular/circular tanks with flat bottom.

SECTION D

7. Flow Through Pipes:

Definition, laminar and turbulent flow, explain through through Reynold's experiment.
Reynolds number, critical velocity and velocity distribution.
Head lose in pipe lines due to friction, sudden expansion and sudden contraction, entrance, exit, obstruction and change of direction (No dervation of formulae).
Flow from one reservoir to another through long pipe of uniform and composite section.
Water hammer phenomenon and its effects (Only elementary treatment).
Pipes in series and parallel.
Syphon.

8. Flow Through Open Channels

Definition of a channel, uniform flow and open channel flow.
Discharge through channels using
(i) Chezy's formulae (no derivation)
(ii) Manning's formulae
Most economical sections
(i) Rectangular
(ii) Trapezoidal
(iii) Circular

9. Flow Measurements

Measurement of velocity by Pitot tube, current -meter, surface float, velocity rods.
Measurement of discharge by a notch
(i) Difference between notches and orifices.
(ii) Discharge formulae for rectangular notch, triangular notch, trapezoidal notch and conditions for their use (no derivation).
Measurement of Discharge by weirs
(i) Difference between notch and weir.
(ii) Discharge formulae for free, drowned and broad crested weir with and without end contractions; velocity of approach and condition of their use.
(iii)Venturi fumes to measure flow.
(iv) Measurement of discharge by velocity area-method

10. Hydraulic Machines

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

DCE-350P HYDRAULICS

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. To verify Bernoulli's theorem
2. To find out venturimrter coefficient
3. To determine coefficient of velocity (Cv)., Coefficient of discharge (Cd), Coefficient of contraction (Cc) of an orifice and verify the relation between them
4. To perform Reynold's Experiment.
5. To determine Darcy's coeficient of friction of flow through pipes
6. To verify loss of head due to:
(a) Sudden enlargement
(b) Sudden Contraction
7. To determine velocity of flow of flow of an open channel by using a current meter.
8. To determine coefficient of discharge of a rectangular/triangular notch.
9. Study of the following:
(i) Reciprocating pump or Centrifugal pump
(ii) Impulse turbine or Reaction turbine
(iii) Pressure Gauge/water meter/mechanical flow meter/ pitot tube.

SEMESTER-IV

DCE-410P CIVIL ENGINEERING DRAWING-I

Maximum Time : 3 Hrs. **University Examination : 70Marks**
Total Marks : 100 **Continuous Internal Assessment : 30Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A
DRAWING No.1
Details of spread footing foundations for load bearing and non-load bearing wall for given thickness of walls with the help of given data or rule of the thumb, showing offsets, position of DPC; details of basement showing necessary damp proofing.
Detail of cavity wall.
DRAWING No.2
Plans of T and Corner junction of walls 1 Brick, 1-1/2 Brick and 2 brick thick in English and Flemish bonds brick pillars.
SECTION B
DRAWING No.3
Elevation, sectional plan and sectional side elevation of paneled and glaze d door flush door, steel windows and aluminium windows.
DRAWING No.4
Drawing plan, elevation of a small building by measurement.

SECTION C
DRAWING No.5
Detailed plan, elevation and section of a two bedroom residential building from a given line plan, showing details of foundations, roof and parapet.

DRAWING No.6
Detailed working drawing of a small double stories building on a given plot, keeping in view building eye laws, showing slooping roof or surface drainage plan and flooring details.

SECTION D
DRAWING No.7

Each student should be guided to trace any one of the drawings of sheet no 4,5 and 6 with waterproof ink.

DRAWING No.8

Each student should be required to take out ammonia print of the tracing made by him.

Note : -

a) All drawings should be as per BIS code and specifications in SI units

b) Intensive practice of reading and interpreting building drawings should be given

DCE-420 CONCRETE TECHNOLOGY

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Introduction

Definition of concrete, brief introduction to properties of concrete, advantages of concrete, uses of concrete in comparision to other building materials.

2. Ingredients of Concrete

Cement

The chemical ingredients causing changes in properties, situations of use and special precautions in the use of following types of cements: Ordinary Portland cement, rapid handling cement, low heat cement , high alumina cement, blast furnace slag cement, quick setting, white and coloured cements, Portland pozzolana cement

Aggregates:

(i) Classification of aggregates according to source, size and shape

(ii) Characteristics of aggregates: Particle size and shape, crushed and rounded aggregates, surface texture, specific gravity of aggregate; bulk density, water absorption, surface moisture, bulking of sand, deleterious materials in the aggregate;

(iii) Grading of aggregates, coarse aggregate, fine aggregate; All in aggregate;

fineness modulus; interpretation grading charts and combination of two aggregates

Water:

Lime on the impurities as per IS; effect of excessive impurities an concrete, ascertaining the suitability of water with help of concrete cube test

3. Properties of Concrete:

Properties in plastic stage, workability, segregation, bleeding

Properties of hardened concrete: strength, durability, impermeability, dimensional changes;

SECTION B

4. Water Cement Ratio:

Hydration of Cement, effect of water cement ratios on the physical structure of hydrated cement, water cement ratio law and the conditions under which the law is valid; internal moisture, temperature, age and size of specimen.

Definition of cube strength of concrete, relations between water cement ratio and strength of concrete.

Use of CRRI charts and BIS codes.

5. Workability

Definition, phenomenon of workability, concept of internal friction, segregation and harshness; factors affecting workability; water content; shape, size and percentage of fineness passing 300 micron.

Measurement of workability; slump test and compaction factor test; recommended slumps for placement in various conditions of placement.

SECTION C

6. Proportioning For Ordinary Concrete

Object of mix design, strength required for various grades from IS 456, preliminary test, cube test, proportionating for ordinary mixas prescribes by BIS and its interpretation.

Adjustment on site for: Bulking water contents, absorption, workability, design datas for moisture, bulkage, absorption and suitable fine aggregate andcoarse aggregate ratio.

Difference between ordinary and controlled concrete. Introduction to fines concrete.

7. Form Work

Concept of factors affecting the design of form work (shuttering and staging)

Materials used for form work (including raw materials).

Sketches of form work for column, beam and slab.

Precautions to be taken before during and after RCC construction

Stripping time for form work as per BIS (no problem on the design of form work)

Removal of form work.

SECTION D

8. Special Concretes:

(i) New materials

Materials for light weight concrete

Flyash

Materials for high strength concrete

Accelerators and retarders

Air entraining and set controlling agents

Water reducing and set controlling agents

Special bonding agents like epoxy

Polymer concrete

(ii) Concreting under special conditions

Cold weather concreting

Under water concreting

Hot weather concreting

Special locations i.e. mass concreting, high strength concreting

9. Concrete Operations

Storing of cement:

Storing of cement in warehouse

Storing of cement at site

Effect of storage on strength of cement

Determination of warehouse capacity for storage of Cement
Storing of Aggregate
Storing of aggregate on site for maintaining uniformity of moisture and cleanliness
Batching
Batching of cement
Batching aggregate by:
Volume, using gauge box (farma) selection of paper gauge box
Weight spring balances and by batching machines
Measurement of water
Mixing
Hand mixing
Machine mixing-types of mixers, capacities of operation of moxers
Transportation of Concrete
Transportations with and situations of use of the following: pans, wheel, barrows, truck mixers, chutes, belt conveyors, pumps, tower crane and hoists etc.
Placement of concrete
Prior preparation before placement; when put on natural soil, rocky base, specially prepared sub base (brick soiling and water bound macadam base), hardened concrete base, checking of form work, checking provision for joints
Placement of concrete-precautions to be taken.
Compaction
Hard compaction, pavement, narrow and deep members
Machine compaction compaction-types of vibrators internal screed vibrators and form vibrators, methods of handling screed vibrators and immersion vinrators, suitability of concrete mixes for compaction with vibrators.
Selection of suitable vibrators for various situations
Finishing concrete slabs, floating and trowelling
Curing
Object of curing, method of curing, shading concrete works, covering surfaces with besian, gunny bags, sprinkle of water, ponding method and membrane curing, steam curing
Recommended duration for curing and removal of form work
Jointing
Location of construction joints, treatment of construction joint before the concrete is poured, concreting at these points, expansion joints in concrete in buildings their importance and location
Note: - A field visit may be planned to explain and show the relevant things

DCE-420P CONCRETE TECHNOLOGY

Maximum Time :3 Hrs. **University Examination : 35 Marks**
Total Marks :50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. To determine the compressive strength of Portland cement (IS-269)
2. To determine flakiness index and elongation index of coarse aggregate (IS 2386-Part I)
3. Field method to determine fine silt in aggregate.
4. Determination of specific gravity and water absorption of aggregate (IS-2386-part III for aggregates of size 40 mm to 10 mm)

5. Determination of bulk density and voids of aggregates ((IS-2386-part III)
6. Determination of surface moisture in fine aggregate by displacement method (IS 2383 – Part III)
7. Determination of particle size distribution of fine, coarse and all in aggregate by sieves analysis (grading of aggregate0
8. To determine necessary adjustment for bulking of fine aggregate by field method (IS-2383-Part III)
9. Test for workability (slump test):

(a)To verify the effect of water, fine aggregate/coarse aggregate ratio and aggregate/Cement ratio on slump

(b) To test cube strength of concrete with varying water cement ratio

10. Compaction factor test for workability (IS: 1199)
11. Non destructive test on concrete

(a) Rebound hammer test

(b) Ultrasound test

12. Tests for compressive strength of concrete cubes for M-15 or M-20 grade

DCE-430 STRUCTURAL MECHANICS

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Properties of Materials

Classification of materials, elastic materials, plastic materials, ductile materials, brittle materials.

Tensile test, compressive test, impact test, fatigue test, torsion test.

2. Simple Stresses and Strains

Concept of stress, normal and shear stresses due to torsion

Concept of strain, strain and deformation, longitudinal and lateral strain, poison's ratio, Volumetric strain

Hooke's law, modulli of elasticity and rigidity, Bulk modulus of elasticity, relationship between the elastic constants.

Stresses and strains in bars subjected to tension and compression. Extension of uniform bar under its own weight, stress produces in compound bars (two or three) due to axial load.

Stress-strain diagram for mild steel, mechanical properties, factor of safety
Temperature stresses and strains

SECTION B

3. Bending Moment and Shear Force

Concept of a beam and supports (Hinges, Roller and Fixed), types of beams: simply supported, cantilever, fixed and continuous beams
Types of loads (point, uniformly distributed and varying loads)
Concept of bending moment and shear force, sign conventions
Bending Moment and shear force diagrams for cantilever, simply supported and over hanging beams subjected to concentrated, uniformly distributed and uniformly varying loads (B.M. and S.F. diagrams should preferably be drawn on graph paper.
Relationship between load, shear force and bending moment, point of maximum bending moment and contraflexure.

4. Second Moment of Area

Concept of second moment of area, radius of gyration
Theorems of parallel and perpendicular axes
Second moment of area for sections of Rectangle, Triangle, Circle, Trapezium,
Angle, Tee, I, Channel and Compound sections. (No derivation)

5. Bending and Shear Stresses

Theory of simple bending
Application of the equation M / I= sigma / Y= E/R (No derivation is required)
Moment of resistance, sectional modulus and permissible bending stresses in circular, rectangular, I, T and L sections; Comparision of strengths of the above sections.

SECTION C

6. Slope and Deflection

Necessity for determination of reflection
Moment area theorems (no derivation)
Computation of slopes and deflections using moment area theorems for:
(a) Simple supported beam with UDL over entire span and concentrated load at any point
(c) Cantilever with UDL over entire span and concentrated load at free end

7. Columns

Theory of columns, Euler, Rankine's and I.S. formulae.

SECTION D

8. Combined Direct and Bending Stresses

Concentric and eccentric loads, eccentricity
Effect of eccentric load on the section, stresses due to eccentric loads, examples in the case of short columns.
Effect of wind pressure on walls and chimneys; water pressure on dams and earth pressure on retaining walls their causes of failures and their stability.

9. Analysis of Trusses

Concept of a frame, redundant and deficient frame, End supports, ideal and practical trusses.
Analysis of trusses by:
(i) Methods of joints
(ii) Method of sections and
(iii) Graphical method

DCE-430P STRUCTURAL MECHANICS

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. Determination of yield stress, ultimate stress, percentage elongation and plot the stress strain diagram and compute the value of Young's modulus on mild steel
2. Determination of Young's modulus of elasticity for steel wire with Searl's apparatus
3. Determination of modulus of rupture of a timber beam
4. Determination of maximum deflection and Young's modulus of elasticity in simple supported beam with load at middle third
5. Verification of forces in a framed structure

DCE-440 SURVEYING-I

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Introduction

Content of surveying, purpose of surveying, measurements-linear and angular, units of measurements classification of survey based on instruments.

Instruments used for taking these measurement, Classification to survey based on instruments.

Basic principles of surveying

SECTION B

2. Chain Surveying

Purpose of chain surveying, principles of chain surveying.

Equipment used in chain surveying, chain types, ranging rods, arrows, pegs, cross staffs, Indian optical square-their construction and use.

Different operations in chain surveying

(i) Ranging (Direct/indirect)

(ii) Offsets (perpendicular/oblique)

Changing (flat and sloping ground)
Conducting chain survey over an area, recording the field data, plotting the chain survey, conventional signs.
Obstacles in chain surveying
(i) Errors in chain surveying
(ii) Correction for erroneous length of cahin, simple problems on this.
Testing and adjustment of chain and Indian optical square.

SECTION C

3. Compass Surveying

Purpose of compass surveying, Construction and working of prismatic compass, use of peismatic compass: Setting and taking observations.
Concept of :
a) Meridian-Magnetic and true
b) Bearing-Magnetic. True and Arbitrary
c) Whole circle bearing and reduced bearing
d) Magnetic dip and declination
Local attraction-causes, detection, errors and correction, problems on local attraction, magnetic declination calculation of included angles in a compass traverse.
Concept of a traverse-Open and closed. Traversing with a compass-By included end deflection and closed traverse, plotting a traverse-By included end deflection angles, concept of closing error, adjustment of traverse graphically by proportionate method.

SECTION D

4. Leve lling

Purpose of leveling, concept of a level surface, horizontal surface, vertical surface, daturn, 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.
Temporary adjustment: setting up and leveling, adjusting for parallax of Dumpy and I.O.P. level, Different leveling
Concept of back sight, foresight, intermediate sight, station change point, height of instrument.
Level book and reduction of levels by
(i) Height of collimation method and
(ii) 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, testing and adjustment of IOP level.
Numerical problems.

Note : - For various surveying equipment relevant Indian Standards should be followed

DCE-440P SURVEYING-I

Maximum Time :3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. Chain Surveying
(i)
Ranging a line
Chaining a line and recording in the field work
Testing and adjustment of chain
Taking offsets-perpendicular and oblique (with a tape only)
Setting out right angle with a tape
(ii)
Chaining of a line involving reciprocal ranging
Taking offsets and setting out right angles, with corss staff and Indian optical square
(iii)
Chain survey of a small area (field work and plotting)
Chaining a line involving obstacles to ranging
2. Compass Surveying
(v)
Study of prismatic compass
Setting the compass and taking observations
Measuring angles between the lines meeting at a point
(vi)
Traversing with the prismatic compass and chain a closed traverse (Recording and plotting by included angles)
3. Levelling
(vii)
Study of dumpy level and leveling staff
Temporary adjustments of a Dumpy level
Taking staff readings of different stations from the single starting and finding differences of level between them.
(ix)
Study of IOP level
Its temporary adjustments
Taking staff readings of different stations from the single starting and finding differences of level between them.
(x)
Longitudnal and cross sectioning of a road/ railway/canal
Setting a gradient by dump and IOP level.

DCE-450P IRRIGATION ENGINERING

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Introduction

Definition of irrigation
Necessisity of irrigation
History of development of irrigation in India
Types of irrigation
Sources of irrigation water

2. Rain Fall and Run-Off

Definition of rainfall and run-off. Catchment area, Dicken's and Ryve's formulae
Types of rain gauges-Automatic and non-automatic
Stream gaugling

3. Water Requirement of Crops

Definition of crop season
Duty, Delta and Base Period, their relationship
Gross command area, culturable command area, Intensity of irrigation, Irrigable area
Water requirement of different crops of different crops-Kharif and Rabi

SECTION B

4. Lift Irrigation

Types of wells- shallow and deep well, acquifer types, ground water flow, construction of open wells and tubewells
Yield of an open/ tube well and problems
Methods of lifting water- Manual and mechanical devices, use of wind mills

5. Canal Head works

Definition, object, general layout, functions of different parts of head works
Difference between weir and barrage

6. Flow Irrigation

Irrigation canals
Perennial irrigation
Different parts of irrigation canals and their functions
Sketches of different canal cross-section

Classification of canals according to their alignment
Design of irrigation canals - Chezy's formulae, Meanings formulae, Kennedy's and Lecey's silt theories and equations, comparision of above two silt theories, critical velocity ratio
Various types of canal lining- Advantages and disadvantages

SECTION C

7. Regulatory Works

Functions and explanation of terms used
Cross and head regulators
Falls
Energy dissipators
Outlets-different types
Escapes

8. Cross Drainage Works

Functions and necessity of the following types: aqueduct, siphon, superpassage, level crossing, inlet and outlet
Constructional detail of the above

SECTION D

9. Dams

Earthern dams-types, causes of failure
Classification into masonry and concrete dams
Labelled cross section of gravity dam
Spillways-types and uses

10. Water Logging and Drainage

Definition, causes and effects, detection, prevention and remedies
Surface and sub-surface drains and their layout

11. Tubewell Irrigation

Introduction, occurrence of ground water, location and command, advantages of tube wells
Tube wells, explanation of terms water table, radius of influence, depression head, cone of depression, confined and unconfined aquifers
Types of tube wells and their choice-cavity, strainer and slotted type:
Method of construction boring, installation of well assembly, development of well, pump selection and installation and maintenance.

SEMESTER-V

DCE-510P CIVIL ENGINEERING DRAWING-II

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

B) Instructions for candidates
1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A
PUBLIC HEALTH ENGINEERING DRAWING
1. Drains and Sewers
Cross section of standard types of open drains (circular, v-shaped and u-shaped) with their foundations
Cross section of earthe rn waere and RCC sewer pipes
Cross sections of masonry sewers (circukar and egg shaped)
2. Traps. Manholes and Inspection chambers
Detailed section of floor trap and gully trap
Detailed plan and section of an inspection chamber
Detailed plan and section of a manhole for the given data

SECTION B
3. Septic Tank and Soak Pit
Detailed plan and cross-sections of a domestic septic tank and soak pit for 10 users with details of open jointed pipes as per IS 2470 Part I
4. Bath Room and W.C. Connections
Cross section through the external wall of lavatories at ground and first floor showing the single and double pipe system and the connections of lavotary, bath, basin tapes, shower and towel rail
5. Draw the plan and section of a two bed roomed double storeyed residential buildings showing details of water supply and sanitary installation and drainage systems. Show the drainage and water supply upto the municipal systems on the site plan also.
6. Practice of reading water supply and sanitary engineering drawimgs

SECTION C
IRRIGATION ENGINEERING DRAWING
7. Typical Cross –Section of a channel
Typical cross section of an unlined channel in cutting, partly cutting and partly filling and fully in filling
8. Well and Tube Well
Plan and cross-section of tube well with pump house

SECTION D
9. A.P.M. Outlet
Working plan and L-section through an A.P.M outlet
10. Distributory Falls
Plan, cross section and L-section of Central Design Office (CD)) type fall with details of wing wall, pitching. Flooring and toe wall
11. Syphon Aqueduct
Detailed cross-section and L-section of a siphon aqueduct from a given data
12. Culvert
Plan and cross section of a simple culvert

DCE-520 ELEMENTS OF RCC CESIGN

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A
1. Introduction
Concept of Reinforced Cement Concrete
2. Reinforcement Materials
Various types of reinforcing materials
Suitability of steel as a reinforcing materials
Properties of different types of steel (mild steel, medium tensile steel and deformed bars)
3. Theory of R.C.C. Beams
Assumption in the theory of simple bending for RCC beam
Flextural strength of a singly reinforced beam
Position of Neutral axis, resisting moment of the section, critical neutral axis, concept of balanced, under reinforced over reinforced sections.

Shaer strength of singly reinforced RCC beam. Assumptions made, permissible shear stresses as per IS code of practice, actual average shear stresses in singly reinforced concrete beam, concept of diagonal stirrups and inclined bars, shear strength of a RCC beam section

SECTION B

4. Bond in RCC beams

Concept of bond local and average bond
Permissible bond stresses for plain and deformed bars as per IS code of practice
Minimum length of embedment of bars
Actual bond stress in RCC Beams
Bond length (standard hook, slice length as per IS code of practice)
Loads and loading standards for beams as per IS_875
Design of singly reinforced concrete beam as per IS code of practice from the given data such as span, load and properties of materials used.
Design of lintel
Design of main/secondary beam for a RCC flat roof and floor
Design of a cantilever beam/slab

5. Doubly Reinforced Concrete Beams

Doubly reinforced concrete beam and its necessity
Strength of a doubly reinforced concrete beam section
Design of a doubly reinforced concrete beam

6. RCC Slabs:

Structural behaviour of slabs under UDL
Type of end supports
Design of one way slab
Design of two slab with the help of tables of IS:456

SECTION C

7. Reinforced Brick Work

Reinforced brick work and its use in slab and lintels
Limitations of the use of RB work
General principles of design of reinforced brick lintels and slabs
Design of RB lintels and slabs
Specifications for RB work construction

8. T-Beams

Structural behaviour of beam and slab floor laid monolithically
Rules for the design of R-beams
Economical depth of T-beams, strength of T- beams
Design of simply supported T-beams using IS code of practice

SECTION D

9. Columns:

Concept of long and short columns
IS specifications for main and lateral reinforcement
Behavior of RCC columns under axial load
Design of Axially loaded short and long columns with hinged ends
Design of Isolated footings

10. Basic Concept of Prestressed Concrete

Introduction of prestressed concrete, general theory, Linear post tensioning-general, post tensioning advantages to the design engineer and the contractor

Linear post tensioning system, high strength post tensioned stands, parallel lay wire, high strength alloy steel bars
Techniques of post tensioning - general, special requirements for forming and false work, ducts and closures, placing of ducts or tendons, concreting, stressing procedure, grouting, protecting anchorage from corrosion
Pretionsioning-general, pretensioning yards set up, forms for pretensioning structural elements. Special techniques of pretensioning
Materials of prestressing-cement, aggregates, concrete, admixtures, vibrations, curing light weight aggregates, high strength steel bars, high strength stand, stress relaxation, galvanization Codes specifications and inspection, manufacturers of prestressing equiment, specifications, sizes and costs

DCE-530 TRANSPORTATION ENGINEERING

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A
HIGHWAYS
1. Introduction
Importance of highway transportation; Important organizations like Central Road Research Institute, Indian Roads Congress, Ministry of Surface Transport
Functions of Indian Road Congress
IRC classification of roads
Organisation of state highway department
2. Road Geometrics
Glossary of terms used in geometrics and their importance: Right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation levels, camber and gradient
Design and average running speed, stopping and passing sight distance
Curve necessity, horizontal and vertical curves including transition curves and superelevation. Methods of providing superelevation
Widening of roads on curves
Use of IRC design tables and specifications for finding elements of road geometrics.
Drawing of typical cross-sections in cutting and filling on straight alignment and at a curve

3. Highway Surveys and Plans

Designation of topographic map, reading the data given on a topographic map
Basic considerations governing alignment for a road in plain and hilly area
Highway location; marking of alignment; importance of various stages viz;
a) Reconnaissance survey: Conduct reconnaissance and prepare reconnaissance report
b) Preliminary survey: Object, Organising, conducting and informations to be collected
c) Location survey
d) Standards for preparing the highway plans as per Ministry of Surface Transport (MOST)

4. Road Materials

Different types of road materials in use; soil aggregates binders
Function of soil as highway subgrade
California Bearing Ratio; method of finding CBR value and its significance
Testing aggregates: Abrasion test, impact test, crushing strength test, water absorption test and soundness test
Aggregates: Availability of road aggregates in India, requirements of road aggregates as per IS specifications
Binders: Common binders; cement bitumen and Tar, properties as per IS specifications penetration and viscosity test of bitumen, procedure and significance, cut back and emulsion and their uses

SECTION B

5. Road Pavements

Road Pavement: Flexible and rigid pavement, their merits and demerits, typical crosssections,
functions of various components
Sub-grade preparation:
Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profiles of embankment, construction of embankment compaction, stabilization, preparation of subgrade, methods of checking
Camber, gradient and alignment as per recommendations of IRC, equipment used for subgrade preparation.
Flexible pavements: sub base necessity and purpose, stabilized sub base, purpose of stabalization
Types of stabalization
a) Mechanical stabalization
b) Lime stabalization
c) Cement stabalization
d) Fly ash stabalization
Base of Course
Preparation of base course: Prime coat, Tack coat
a) Brick soiling
b) Stone stoiling
c) Metalling: Water bound macadam and bituminous macadams
Methods of construction as per Ministry of surface transport
Prime coat, tack coat, seal coat
Surfacing: Types of surfacing
a) surface dressing
b) (i) premix carpet
(ii) semi dense carpet
c) Bituminous concrete

d) Grouting
Methods of constructions as per Ministry of Surface transport, specifications and quality control; equipment used.
Rigid Pavements:
Construction of concrete roads as per IRC specifications: Form laying, mixing and placing the concrete, compacting and finishing, cutting , joints in concrete pavement, equipment used

SECTION C

6. Hill Roads

Introduction : typical cross-sections showing all details of a typical hill road in cutting, partly in cutting and partly in filling
Landslides: Causes, preventions and control measures

7. Road Drainage

Necessity of road drainage work, cross drainage works
Surface and subsurface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage. Intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross sections

8. Road Maintenance

Common types of road failures-their causes and remedies
Maintenance of bituminous roads such as patch work and resurfacing
Maintenance of concrete roads-filling cracks, repairing joints, maintenance of shoulders (berms), maintenance of traffic control devices

9. Construction Equipment

Output and use of the following plant and equipments
Hot mix plant and mix all battery
Tipper, factors (wheel and crawler) scraper, bull-dozer, drumpers, shovels, grader, roller, dragline.
Asphalt mixer and tar boilers
Road pavers

SECTION D

10. Railways

Different types of gauges and sections
Characteristics of Railway embankments
Concept of creep

11. Bridges

Different types of bridges
Components of a bridge
Bridge foundations

12. Tunnels

Necessity of tunnels
Methods of construction of tunnels in hard and soft rocks
Ventilation and drainage of tunnels

DCE-530P TRANSPORTATION ENGINEERING

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. Determination of the California bearing ratio (CBR) the sub-grade soil (demonstration only)
2. Determination of penetration value of bitumen
3. Determination of softening point of Bitumen
4. Determination of impact value and crushing value of the road aggregate
5. Determination of abrasion value of road aggregate
6. Determination of ductility of bitumen
7. Determination of viscosity of tar / bitumen

DCE-540 SOIL AND FOUNDATION ENGINEERING

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Introduction

Importance of soil studies in Civil Engineering

Geological origin of soils with special reference to soil profiles in India :Residual and transported soil, Alluvial deposits. Lake deposits, dunes and loess, glacial deposits, conditions in which above deposits are formed and their engineering characteristics.

Engineering classification of soils, comparision between sand and clay.

2. Physical Properties of Soils:

Constituents for soil, phase diagram for soil

Definitions and meaning of void ratio, porosity, degree of saturation, water content, specific gravity of soil grains, unit weight, dry unit weight

Simple numerical problems with the help of phase diagrams

3. Soils Classification and Identification

Particle size, shape and their effect on engineering properties of soil

Gradation of soil particles and its influence on engineering properties

Relative density and its use in describing cohesionless soils

Behaviour of cohesive soils with change in water content, Atterberg limitsdefinitions, use and practical significance
Field identification test for soils
BIS soils classification systems; basis, symbols, major divisions and sub divisions, groups, plasticity chart: procedure to be followed in classifying a given soil into a group

SECTION B

4. Flow of Water Through Soils:

Concept of permeability and its importance
Darcy's law, coefficient of permeability, seepage velocity and factors affecting permeability
Comparision of permeability of different soils as per BIS
Measurement of permeability in the laboratory and in the field

5. Effective Stress: (Concept Only)

Stresses in subsoil
Definition and meaning of total stress, effective stress and neutral stress
Principle of effective stress
Importance of effective stress in engineering problems

6. Deformation of Soils

Meaning, conditions/situations of occur rence with emphasis on practical significance of:
a) Consideration and consolidation settlement
b) Creep
c) Plastic flow
d) Heaving
e) Lateral movement
Definition and practical significance of compression index, coefficient of consolidation, degree of consolidation
Meaning of total settlement, uniform settlement, different settlement and rate of settlement and their importance
Settlement due to construction operations and lowering of water table
Tolerable settlement for different structures as per Bis

SECTIONC

7. Strength Characteristics of Soils

Examples of shear failure in soils
Factors contributing to shear strength of soils, Coloumb's law
Determination of shearing strength dirct shear test and unconfined compression test.
Brief idea about triaxial shear test,comparison between direct shear test and triausual test.
Drainage conditions of test and their significance
Stress and strain ciurve, peak strength and ultimate strength, their significance
Discrepancies between laboratory and field tests.

8. Soil Compaction

Definition of compaction and its necessity
Laboratory compaction test (light and heavy as per BIS) definition and importance of optimum water content, maximum dry density, moisture dry density relations for typical soils wit h different compactive efforts
Field compaction: methods and equipment, choice of equipment
Compaction requirements
Compaction control; Density control, field density test. (sand replacement), moisture control, Proctor's needle and its use, thickness control, jobs of an embankment supervisor in relation to compaction

Factors affecting compaction

SECTION D

9. Bearing Capacity

Concept of bearing capacity

Definition and significance of ultimate bearing capacity safe bearing capacity and allowable bearing pressure

Bearing capacity from building codes

Factors affecting bearing capacity

Concept of vertical stress distribution in soils due to foundation loads

Plate load test and interpretation of its results, limitations of plate load test

Bearing capacity by SPT and unconfined compression test

Soil properties governing choice of foundation type

Methods of improving bearing capacity of soil

10. Soil Exploration

Purpose and scope of soil exploration

Undertaking planning of subsurface investigations

Influence of soil conditions on exploratory programme

Possibility of misjudgement of subsoil conditions

Location, depth and spacing of exploration

Influence of size of project and type of structure on exploratory programme

Methods of soil exploration; Reconnaissance, Trial pits, borings, (Auger, wash, rotary percussion to be briefly dealt), SPT and dynamic con e penetration test (Brief description and information collected)

Groundwater level measurement

Sampling:undisturbed, distributive and representative samples; selection of type of sample; thin wall and piston samples; area ratio, recovery ratio of samples and their significance. Number and quantity of samples, resetting, sealing and preservation of samples.

Presentation of soil investigation results

11. Foundation Engineering

Concept of hollow and deep foundation; types of shallow foundations and their suitability; Factors affecting the depth of shallow foundations; deep foundations, classification of piles according to function and material;, installation of concrete piles (under reamed, bored, compaced) and their suitability; load carrying capacity of piles; constructional features of pile foundations, well foundation

DCE-540P SOIL AND FOUNDATION ENGINEERING

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. Auger Boring and standard penetration test
Identifying the equipment and accessories
Conducting boring and SPT of a given location
Collecting soil samples and their identification
Preparation of boring log and SPT graphs
Interpretation of test results
2. Extraction of Disturbed and Undisturbed Samples
Extracting a block sample
Extracting a tube sample
Extracting a disturbed samples for mechanical analysis. Compaction and limit test
Field identification of samples
3. Field Density Measurement (Sand Replacement and Core Cutter Method)
Caliberation of sand
Conducting field density test at a given location
Determination of water content
Computation and interpretation of results
4. Liquid Limit and Plastic Limit Determination
Identifying various grooving tools
Preparation of sample
Conducting the test
Observation soil behaviour during tests
Computation, plotting and interpretation of results
5. Mechanical Analysis
Preparation of sample
Conducting sleeve analysis
Computation of results
Plotting the grain size distribution curve
Interpretation of the curve
6. Laboratory Compaction Tests)Standard Proctor test)
Preparation of sample
Conducting the test
Observing soil behaviour during test
Computation of results and plotting
Determination of optimum moisture and maximum dry density
7. Unconfined Compression Test
Specimen Preparation
Conducting the test
Plotting the graph
Interpretation of results and finding/bearing capacity
8. Direct shear test on sandy soil samples

DCE-550 SURVEYING-II & CAMP

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Plane Table Surveying

Purpose of plane table surveying, equipment used in plane table survey:
Plane table
Alidade (Plain and Telescopic)
Accessories
Setting of a Plane Table
Centering
Levelling
Orientation
Methods of plane table surveying
Rediation,
Intersection
Traversing
Resection
Two Point Problem
Three Point Problem
Mechanical method (Tracing paper)
Bessel's Graphical method
Trial and error method
Errors in plane table survey and precautions to control them. Testing and adjustment of plane table and alidade

2. Contouring

Concept of contours, purpose of contouring, interval and horizontal equivalent, factors affecting contour interval, characteristics of contours, methods of contouring:
Direct and indirect, use of stadia measurements in contour survey, interpolation of contours, use of contour map. Drawing cross section from contour map; marking alignment of a road, railway and a canal on a contour map, composition of earth work and reservoir capacity from a contour map

SECTION B

3. Theodolite Surveying

Working of transit vernier theodolite, fundamental axes of a theodolite and their relation; temporary adjustments of a transit theodolite; concept of vernier, least count and reading a vernier; concept of transmitting, swinging, face, left face right and changing face, measurement of horizontal and vertical angles. Prolonging a line (forward and backward) measurement of bearing of a line; traveling by included angles and deflection angle method; traversing by stadia measurement, theodolite triangulation, plotting a traverse, concept of coordinate and solution of ommited measurements (one side affected), errors in theodolite survey and precautions taken to minimise them; limit of precision in theodolite traversing. Brief introduction to tacheometry and use of tacheometric tables

SECTION C

4. Curves:

Simple circular curves

Need and definition of a simple circular curve; Elements of simple circular curves-
Degree of the curve, radius of the curve, tangent length, point of intersection (Apex point), tangent point length of a curve, long chord deflection angle, Apex distance and Mid-ordinate. Setting out of simple circular curve:

a) By linear measurements only

offsets from the tangents

Successive bisection of arcs

Offsets from the chord produced

b) By tangential angles using a theodolite

Transition curves

Need (centrifugal force and super elevation) and definition of transition curve, rerquirements of transition cur ves; length of transition curves for roads; by cubic parabola; calculation of offsets for a transition curve; setting out of a transition curve by tangential offsets only.

Vertical curves

Setting out of a vertical curve

SECTION D

5. Minor Instruments

Study and use of the instruments given below to be explained in addition to providing practice:

a) Abney level

b) Tangent clinometer

c) Proportionate compass

d) Ceylone Ghat Tracer

e) Pentagraph

f) Planimeter

Note: -

a) For various surveying equipment relevant Indian standards should be followed

b) No sketch of the instruments may be asked in the examination

DCE-550P SURVEYING-II & CAMP

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

1. Plane Table Surveying
Study of the plane table survey equipment
Setting the plane table
Marking the north direction
Plotting a few points by radiation method
Orientation by
Trough compass
Back sighting
Plotting a few points by intersection method
Traversing an area with a plane table (at least five lines)
To plot the position of plane table station by solving:
a) Two point problem
b) Three point problem by
Tracing paper method
Bessel's graphical method
Trial and Error method
Setting and checking grades with abney level. Setting and checking grades with Ceylong Ghat Tracer
Use of proportionate compass for enlargement reduction of lines and areas of geometrical plane figures, volume of solids and drawing geometrical figures of required number of sides in a circle.
Finding heights by Indian Pattern Clinometer (Tangent Clinometer)
Enlargement/reduction of a plan by the use of pentagraph
Use of planimeter for computing areas
2. Contouring
Preparing a contour plan by radial line method by the use of a Tangent Clinometer/ Tacheometer
Preparing a contour plan by method of squares
Preparing a contour plan of a Road/Railway track/ Canal by taking cross sections.
3. Theodolite:
Taking out the theodolite, mounting on the tripod and placing it back in the box
Study of a transit vernier theodolite; temporary adjustment of theodolite
Reading the vernier and working out the least count, measurement of horizontal angles by repetition and reitration
Prolonging a line forward and backward
Measurement of magnetic bearing
Measurement of vertical angles and use of techeometric tables
Running a closed traverse with a theodolite (at least five sides) and its plotting
4. Curves
Setting out of a simple circular curve with the given data by the following methods
a) Offsets from the chords produced
b) One theodolite method
Setting out a circular curve with transition length by linear measurements

SEMESTER-VI

DCE-610 EARTHQUAKE RESISTENT BUILDING CONSTRUCTION

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A
ELEMENTS OF ENGINEERING SEISMOLOGY
cause of earthquake, seismic wave, earthquake size (magnitude, intensity), classification of earthquake, seismic zoining map of India, static and dynamic loading, static and dynamic equilibrium, fundamental period

SECTION B
seismic behavior of traditionally built construction of India.
Seismic performance during earth quake and mode of failure (out of plane failure , in plane failure, diaphragm failure, connection failure, non structural component failure).

SECTION C
seismic provision of strengthening and retrofitting measure for traditionally built constructions.
introduction of IS : 4326:1993. IS: 13928:1993 & IS:13927:993 with certain clauses.

SECTION D
Common modes of Failure of Rainforced Conceret buildings
Horizontal & vertical irregularities identifications seismic damage in building components (columns, beams, slabs, infill wall, foundation etc.), ductile detailing as per IS-13920.

DCE-620 ELEMENTS OF STEEL STRUCTURAL DESIGN

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Structural Steel and Sections:

Properties of structural steel as per IS: 226 and IS:197
Designation of structural steel sections as per IS handbook and IS:800
Concept of determinate and indeterminate structures

SECTION B

2. Structural Steel Connections:

Riveted connections, types of rivets, permissible stresses in rivets as per IS:800, types of riveted joints, specifications as per IS 800 for riveted joints, design of riveted joints for axially loaded members:, testing and inspection of riveted joints as per IS:800
Welded connections: Types of welds, permissible stresses in welds, types of welded connections, design of butt and fillet welded connections subjected to axial loads, testing and inspection of welded joints as per IS:800

SECTION C

3. Tension Members:

Permissible stresses in tension for steel, design of tension members as per IS:800 (flats, angles and fee sections only).

4. Compression Members:

Concept of buckling of columns, effective length and slenderness ratio, permissible stresses in comparision as per IS:800, strength of columns of single and built up sections with the help of table of permissible compressive stresses.
IS specifications for design of angle, struts and axially loaded columns (no built up columns); use of tacking rivets
Column base sketch of slab base and guesseted base, beam and column connections (no design)

SECTION D

5. Beams:

IS specifications for the design of simply supported steel beams including design of base plate at the ends (laterally restrained beams only), structural behaviour deflected shapes and function of various elements of a plate girder and freehand sketching of a plate girder and its elements.

DCE-630 ESTIMATING AND COSTING

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Buildings

Introduction to estimating: Types of estimates, drawings to attached with these estimates, preparation of rough cost estimates

Units of measurement and units of payment of different items of work

Different methods of taking out quantities-centre line in-to in/out methods

Preparation of a detailed estimate, complete with detailed reports, specifications, abstract of cost and material statement for a small residential; building with a flat roof.

Preparation of a detailed estimate, complete with detailed reports, specifications, abstract of cost and material statement for pitched roof with steel truss only

SECTION B

2. Analysis of Rates:

Steps in the analysis of rates for any item of work requirement of material, labour, sundries and contractors profit

Calculation of quantities of materials for:

a) Plain cement concrete of different proportions

b) Brick masonry in cement and lime mortar

c) Plastering and pointing with cement mortar in different proportions

d) White washing

Analysis of rates of the following items of work when the data regarding labour, rates of material and rates of labour is given

a) Earth work in exacavation and filling with a concept of lead and lift

b) Cement concrete in foundation

c) Damp proof course.

d) RCC and RB in roof slabs
e) First class burnt brick masonry in cement mortar
f) Cement plaster
g) Cement pointing-flush, deep pointing

SECTION C

2. Irrigation

Calculation of earth work for inclined channels with the help of drawings for different cross-sections

Preparation of detailed estimate for a brick lined distributory from a given section

3. Pubic Health

Preparation of detailed estimate for laying a water supply line (CI pipe)

Preparation of detailed estimate for sanitary and water supply fittings in a domestic containing one set of toilets and septic tank

Preparation of detailed estimate for laying a brick sewer

SECTION D

4. Roads:

Methods for calculating earth work using:
i) Average depth
ii) Average cross sectional area
iii) Graphical method

Calculations of quantities of materials for roads in plains for given drawings

Preparation of detailed estimate using the above quantities

Detailed estimate of a single span slab culvert with return wing walls

Calculation of quantities of different items of work for a masonry retaining wall from given drawings.

5. Valuation

Purpose of valuation, principles of valuation

Definition of terms such as depreciation, sinking fund, salvage and scrap value

Valuation of a building property by replacement cost method and rental return method.

Method of calculation of standard rent-concept of capitalized value and years purchase

DCE-640P CIVIL ENGINEERING DRAWING-IV

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks :40%

Steel Structural Drawing

1. Preparation of a working drawing (elevation, plan, details of joints as ridge, eaves and other conections) for a riveted steel roof truss resting on a masonry wall with the given span, shape of the truss and the design data regarding the size of the members and the connections. Also calculate the quantity of steel for the truss.
2. Steel connections (a,b,c,d) riveted and (e) welded all unstiffened
   Beam to beam connections (Seated and franed)
   Beam to column (Seated and franed)
   Column base connections (Slab base and gusetted base)
   Details of column splices
   Connections of a steel bracket with flange of a column
3. Detailed drawing showing plan and elevation for a riveted plate girder with the given design data regarding the sizes of its parts, with details at the supports and connections of stiffeners, flange angles and cover plates with the web.

DCE-650P MAJOR PROJECT WORK

Maximum Time :3 Hrs. **University Examination : 140 Marks**
Total Marks : 200 **Continuous Internal Assessment : 60 Marks**
Minimum Pass Marks :40%

Some of the suggested project activities are given below

1. Setting up of an enterprise
2. Projects connected with repair and maintenance of civil works
3. Estimating and costing projects
4. Design of residential buildings including design of structural members
5. Project work related to quality control of materials, concrete and construction activities
6. Project work related to waste minimization and waste utilisation
7. Preparation of bar bending schedules and estimation of steel requirement
8. Survey Work
9. Valuation of buildings
10. Alignment of roads
11. Design of septic tanks
12. Design of water supply scheme for a locality
13. Design of flood water disposal system
14. Pollution prevention and control studies etc.