

B.TECH. SECOND YEAR

(CIVIL ENGINEERING)

(Batch 2015)

(Session 2016-2017)

SCHEME OF PAPERS

THIRD SEMESTER (Civil Engineering)

Sr.No.	Course No.	Title	L	T	P	Credits
1.	CVE-201	Survey-1	3	1	0	3.5
2.	CVE 202	Building Materials and Construction	3	1	0	3.5
3.	CVE203	Solid Mechanics	3	1	0	3.5
4.	CVE 204	Fluid Mechanics	3	1	0	3.5
5.	CVE 205	Hydrology And Ground Water	3	1	0	3.5
6.	CVE 206	Environmental Impact Assessment	3	1	0	3.5
7.	CVE 251	Survey-I Lab *	0	0	2	1.0
8.	CVE 252	Building Materials Lab *	0	0	2	1.0
9.	CVE 253	Fluid Mechanics Lab *	0	0	2	1.0
10.		Punjabi	3	0	0	0
			18	6	6	24.0
Total Contact Hours: 30						

* CVE 251, CVE 252 and CVE 253 are practical papers only.
There will not be any theory examination for these papers.

- In addition to above mentioned subjects, there will be an additional course on Punjabi as a qualifying subject

Department of Civil Engineering

Punjabi University, Patiala.

General Instructions to the Paper Setters

(Common for B.Tech. in Computer Engineering, Electronics and communication Engineering, Mechanical Engineering, Civil Engineering and Integrated BTech/MBA Branches)

Applicable to 2015 Batch

The B. Tech paper structure will be as shown below:

Pattern of Question Paper	
TITLE OF SUBJECT (CODE----	
Bachelor of Technology (Branch) Section:	
End Semester Exam	
TIME ALLOWED: 3 Hour	Roll. No.....
Maximum Marks: 50	
Note:- Attempt any Six questions selecting three questions from each section A and B. Section C is compulsory.	
Section-A (From Section A of the syllabus)	
Q1.	
Q2.	
Q3.	
Q4.	3x5
Q5.	
Section-B (From Section B of the syllabus)	
Q6.	
Q7.	
Q8.	
Q9.	
Q10.	3x5
Section-C (Common from Whole of the Syllabus)	
Q11	
a).....	
b)	
c)	
d)	
e)	
f)	
g)	
h)	
i)	
j).....	10x2=20

Note for the paper setter:

1. Numbers of questions to be set are nine (11) as per the above format.
2. Section A and B contain 10 questions of (5) marks each.
3. Section C is compulsory and contains ten sub-parts of two mark each. The answers for each question should preferably be of 2 to 3 lines.
4. The maximum limit on numerical questions to be set in the paper is 35% while minimum limit is 20% except theoretical, analysis and design papers
5. The paper setter shall provide detailed marking instructions and solution to numerical problems for evaluation purpose in the separate white envelopes provided for solutions.
6. The paper setters should seal the internal & external envelope properly with signatures & cello tape at proper place.
7. Log tables, charts, graphs, Design data tables etc. should be specified, whenever needed.
8. Use of Scientific calculator should be clearly specified.
9. There are some MBA subjects (like BAS 202 Operational Research, MBA 5011 Foundation of Financial Accounting, MBA 5012 Foundation of Managerial Accounting, MBA 5022 Foundations of Marketing, MBA 5023 Foundations of Law, MBA 5031 Foundations of Macroeconomics, MBA 5032 Foundations of Microeconomics, MBA-5033 Foundations of International Business, MBA 5013 Foundations of Finance) where syllabus is not divided among four sections namely A, B,C,D then Question paper must be set by without specifying section in it and giving proper weightage to the respective portions.

CVE 201 SURVEY-I

L	T	P	Credits
3	1	0	3.5

Section-A

Introduction: Different types of surveys.

Chain Surveying: Principal of chain surveying, description of different equipment, Methods of chaining & booking, selection of base line and stations, obstacles in chaining. Location of inaccessible points by chain, tape & ranging rods.

Prismatic compass survey: Description of Prismatic & surveyors compass methods of traversing, local attraction and its elimination adjustment of closing error by graphical method.

Section-B

Plane Table Survey: Description of different equipment, different methods of plane tabling, Strength of Fix, Two point and three point problems and their solutions.

Leveling: Description of Dumpy and Tilting levels & leveling staves, methods of leveling sensitivity of bubble tube, setting out grade lines permanent adjustment of above mentioned leveling instruments.

Contouring: Setting out contour gradient, different methods of contouring. Simple earth work calculations of areas and volumes.

Minor Instruments: Box sextant, hand level, Abney level, Planimeter, ghat tracer, tangent clinometer etc.

Recommended Books:

1. Kanetkar, T. P., Surveying Vol. I & II, Pune Vidhyarthi Griha Prakashan (1985).
2. P.B. Sahiwny, Surveying
3. Singh, Narinder, Surveying, Tata McGraw Hill (1992).
4. Punmia, B. C., Surveying Vol. I and II, Luxmi Publications (1998).
5. Agor, R., Surveying, Khanna Publishers (1982).
6. Venkataramiah, C., A Text Book of Surveying, Universities Press (1996).

CVE 202 BUILDING MATERIALS AND CONSTRUCTIONS

L	T	P	Credits
3	1	0	3.5

Section-A

Building Stones: General, Qualities of a good building stone, Common building stones of India & their Uses.

Bricks: General, Constituents of bricks, manufacturing of bricks, Brick kilns, desirable and harmful ingredients in brick earth, qualities of good bricks, testing of bricks, strength, Absorption, weathering of bricks, building tiles-roofing; flooring and wall tiles.

Lime: Cementing material, Characteristics of good quality lime, classifications & testing of Lime, uses of different varieties of lime.

Timber: Advantages of timber construction, timber trees-exogenous and endogenous trees; soft and hard woods, structure of tree, felling of trees, defects in timber, characteristics of good timber and its uses.

Miscellaneous Materials: Paints and varnishes; steel; glass and glass products; Fly Ash.

Section-B

Masonry: Stone & Brick: Brick masonry, Bonds and junctions, Walling, Mud wall, Sun-dried bricks, burnt bricks, stones walling, load bearing & non load bearing brick masonry for multistoried constructions, brick panel walling, reinforced masonry. Bonds & junctions

Damp Proof Course: Points of its requirement in buildings, D.P.C. at Plinth level, in basement and roof tops etc.

Lintels & Arches: Location and construction details in wood, brick, stone and R.C.C.

Stairs & Stair cases: Suitability of location, Components and types of staircase, Fire escape.

Doors & Windows: Details, location in buildings, types & construction for wooden & metal doors, Windows in timber & Metal casement, Types of windows.

Roofing and Flooring: Types of Flooring, Flat roofs: Waffle floor, channels, cored units etc., inclined roofs, Form Work and Scaffolding

Foundations: Types and suitability, spread, arch, combined, cantilevered, Raft, Grillage, Piles & wells, Footings in block cotton soil, Basement & Retaining walls

Recommended Books:

- Rangawala, S. C., Engineering Materials, Charotar Publishing House (1992).
- Gambhir, M. L., Concrete Technology, Tata McGraw Hill Publishing Co. Ltd. (2004).
- Kumar, Sushil, Engineering Materials, Metropolitan Press (1994).
- Kumar, Sushil, Building Construction, Standard Publishers and Distributors (1990).
- Singh, Gurcharan, Building Construction Engineering, Standard Book House (1994).
- Sharma, S. K., Building Construction, S. Chand and Company (1994).
- Kumar, Sushil, Building Construction, Standard Publisher and Distributors (1990).
- Punima, B. C., Building Construction, Laxmi Publishing House (1993).
- Sharma and Kaul, A Text Book of Building Construction, S. Chand and Company (1985).

CVE 203 SOLID MECHANICS

L	T	P	Credits
3	1	0	3.5

Section-A

Simple Stresses and Strains: Introduction, stress-strain curves for elastic materials, different types of stresses and strains, elastic limit, Hooke's Law, Young's modulus of elasticity, Bulk modulus, modulus of rigidity, Lateral strain, Elongation due to self weight bars of tapering sections, bars of varying sections, equivalent area of composite sections, temperature stresses, relation between elastic constants. Volumetric strain.

Complex Stress: Introduction, rectangular block subjected to normal stresses along and across two planes, combination of normal and tangential stresses, pure shear, principal stresses and Principal planes, Mohr's Circle, Principal strains, Computation of Principal stresses from Principal strains.

Bending moment & shear force diagrams: Introduction, Types of beams, supports and loading, sign conventions for bending moments and shear forces, Shear force and Bending moment diagrams for simply supported, cantilever and overhanging beams for different types of loading. Relationship between Bending moment, Shear Force and loading.

Bending and Shear Stresses: Introduction, Assumption made in theory of simple bending, derivation of basic equation, determination of stresses in simple sections, built up sections and composite sections. (flitched Beams), Introduction to theory of unsymmetrical bending beams of uniform strength, variation of shear stress across depth of various beam sections.

Section-B

Torsion: Introduction, torsion of shafts and springs, derivation of basic torsion equation, Power transmitted, sections subjected to combined bending and torsion, Principal stresses, equivalent Bending Moment & Torque.

Deflection of Beams: Derivation of basic equation of elastic curve, deflection in beams with different end conditions and different loadings by double integration method, Macaulay's method, moment area theorem, conjugate beam method, unit method.

Columns and Struts: Introduction, Euler's buckling loads for columns with different end conditions, limitations of Euler's formula, column carrying eccentric loads, laterally loaded columns, empirical formula.

Strain Energy: Introduction, Strain Energy due to axial Loads, Bending shear and Torsional stress, Impact load, theories of failure.

Recommended Books:

1. E.P. Popov, Engineering Mechanics of Solids, Prentice-Hall of India Pvt. Ltd., New Delhi, 1996.
2. Timoshenko and Gere, Mechanics of Materials, CBS publishers and Distributors, N Delhi
3. Pytel & Kiusalaas, Mechanics of Materials, Cengage Learning, New Delhi
4. Gere, Mechanics of Materials, Cengage Learning, New Delhi
5. D.K. Singh, Mechanics of Solids, Pearson Education Asia, N Delhi
6. Irning H Shames, James M Pitarresi, Solid Mechanics, PHI, N Delhi
7. Sadhu Singh, Strength of Materials, Khanna Publishers, Delhi.
8. S.M.A. Kazimi, Strength of Materials

CVE 204 FLUID MECHANICS

L	T	P	Credits
3	1	0	3.5

Section-A

Fluid and their properties: Concept of fluid, difference between solids, liquids and gases; ideal and real fluids; Continuum concept of fluid: density, specific weight and relative density; viscosity and its dependence on temperature; surface tension and capillarity, vapour pressure and cavitation, compressibility and bulk modulus; Newtonian and non-Newtonian fluids.

Fluid Statics: Concept of pressure, Pascal's law and its engineering hydrostatic paradox. Action of fluid pressure on plane (horizontal, vertical and inclined) submerged surface, resultant force and center of pressure, force on a curved surface due to hydrostatic pressure. Buoyancy and floatation, stability of floating and submerged bodies, Metacentric height and its determination, rotation of liquid in a cylindrical container.

Fluid Kinematics: Classification of fluid flows, velocity and acceleration of fluid particle, local and convective acceleration, normal & tangential acceleration streamline, pathline and streakline, flow rate and discharge mean velocity continuity equation in Cartesian co-ordinates.

Rotational flows-Rotational velocity and circulation, stream & velocity potential functions.

Section-B

Fluid Dynamics: Euler's equation, Bernoulli's equation and steady flow energy equation; representation of energy changes in fluid system, impulse momentum equation, kinetic energy and momentum correction factors, flow along a curved streamline, free and forced vortex motions.

Dimensional Analysis and Similitude: Fundamental and derived units and dimensions, dimensional homogeneity, Rayleigh's and Buckingham's Pi method for dimensional analysis, dimension less number and their significance, geometric, kinematic and dynamic similarity, model studies.

Laminar and turbulent Flows: Flow regimes and Reynolds number, critical velocity and critical Reynolds number, laminar flow in circular cross section pipes. Turbulent flows and flow losses in pipes, Darcy equation minor head losses in pipe fittings, hydraulic and energy gradient lines.

Flow Measurement: Manometers, Pitot tubes, venturimeter and orifice meters, orifices, mouth pieces, notches and weirs. Numerical problems based upon venturimeter and orifice meters only.

Recommended Books:

1. D.S. Kumar, Fluid Mechanics and Fluid Power Engineering, S.K. Kataria & Sons Publishes, New Delhi.
2. A.K. Jain, Fluid Mechanics, Khanna Publishers, New Delhi.
3. Wylie and Streeter, Fluid Mechanics, McGraw Hill Book Company, New York.
4. Fox and McDonald, Introduction of Fluid Mechanics, John Wiley & Sons (SEA) PTE Ltd., New York.
5. Shams, Mechanics of Fluid, McGraw Hill Book Company, New York.
6. K. Subramanya, Theory and application of Fluid Mechanics, Tata McGraw-Hill Publishing Company, New Delhi.
7. S.C. Gupta, Fluid Mechanics & Hydraulic Machines, Pearson Education Asia, N. Delhi.
8. Douglas JF, Gasiorek JM, Swaffield JP, Fluid Mechanics, Pitman

CVE 205 HYDROLOGY AND GROUND WATER

L	T	P	Credits
3	1	0	3.5

Section-A

Introduction: Hydrologic cycle, Scope and Applications

Precipitation: Types Forms, Measurement by rain gauge and other methods, Design of rain gauges station, Mean precipitation, Presentation of rainfall data, Estimation of missing rainfall data. Test for consistency of record, Analysis of rainfall data, Intensity-depth-area relationship, Duration-Frequency curves, Depth-Area-Duration curves, Frequency analysis of rainfall data.

Abstractions from Precipitation: Evaporation, Factors affecting evaporation, Measurement by different methods, Evaporation measurement, infiltration, Factors affecting infiltration Measurement, Infiltration capacity curve, Infiltration indices.

Run Off: Factors affecting run off, Estimation of run-off (various methods), Rainfall-runoff correlations.

Hydrographs: Components, Base flow separation, Derivation of unit hydrograph and its applications & limitations, Distribution graph, Synthetic and Instantaneous unit hydrograph.

Section-B

Reservoir Planning: Types of reservoir, Storage zones, Selection of reservoir site, Mass curve analysis for reservoir capacity, Reservoir yield and its determination for a given reservoir capacity, Reservoir sedimentation and its control, Reservoir evaporation and Methods for its reduction

Floods: Estimation of peak flood, Methods of flood control, Flood control economics and Flood routing,

Ground Water: Role of Ground Water in hydrological cycle, Distribution of Ground Water, Types of aquifers, Aquifers parameters.

Well Hydraulics: Darcy's law, Types of aquifers, Steady flow towards fully penetrating well, Equation of motion and its applications to ground water flow problems, Determination of aquifer constant in various types of aquifers, Types of tube wells, Methods of construction, Well development.

Recommended Books:

1. Subramanya, K., Engineering Hydrology, Tata McGraw-Hill Publication (2008).
2. Raghunath, H. M., Hydrology, New Age International Publishers (2007).
3. Garg, S. K., Irrigation Engineering and Hydraulic Structures, Standard Book House (2007)
4. Chow, V. T., Applied Hydrology, McGraw Hill Company (2003).
5. Ojha, Bhunia & Berndtsson, Engineering Hydrology, Oxford Publication (2008) .

CVE-206 ENVIRONMENTAL IMPACT ASSESSMENT

	L	T	P	Credits
	3	1	0	3.5
Section A				

INTRODUCTION

Impact of development projects under Civil Engineering on environment - Environmental Impact Assessment (EIA) - Environmental Impact Statement (EIS) – EIA capability and limitations – Legal provisions on EIA.

METHODOLOGIES

Methods of EIA –Check lists – Matrices – Networks – Cost-benefit analysis – Analysis of alternatives – Case studies.

PREDICTION AND ASSESSMENT

Assessment of Impact on land, water and air, noise, social, cultural flora and fauna; Mathematical models; public participation – Rapid EIA.

Section B

ENVIRONMENTAL MANAGEMENT PLAN

Plan for mitigation of adverse impact on environment – options for mitigation of impact on water, air and land, flora and fauna; Addressing the issues related to the Project Affected People – ISO 14000

CASE STUDIES

EIA for infrastructure projects – Bridges – Stadium – Highways – Dams – Multi-storey Buildings – Water Supply and Drainage Projects

TEXT BOOKS

1. Canter, R.L., “Environmental Impact Assessment”, McGraw-Hill Inc., New Delhi, 1996.
2. Shukla, S.K. and Srivastava, P.R., “Concepts in Environmental Impact Analysis”, Common Wealth Publishers, New Delhi, 1992.

REFERENCES

1. John G. Rau and David C Hooten (Ed)., “Environmental Impact Analysis Handbook”, McGraw-Hill Book Company, 1990.
2. “Environmental Assessment Source book”, Vol. I, II & III. The World Bank, Washington, D.C., 1991.
3. Judith Petts, “Handbook of Environmental Impact Assessment Vol. I & II”, Blackwell Science, 1999.

CVE 251 SURVEY-I LAB

L	T	P	Credits
0	0	2	1.0

- 1 Measurement of distance, ranging a line, plotting of details in chain survey.
- 2 Measurement of bearing and angles with compass, adjustment of traverse by graphical method.
- 3 Different methods of leveling, height of instrument, rise & fall methods.
- 4 Plane table survey, different methods of plotting two point & three point problem.

CVE 252 BUILDING MATERIALS LAB

L	T	P	Credits
0	0	2	1.0

Laboratory Work: Various tests on: Cement, Fine aggregates, Coarse aggregate and Fresh concrete.

CVE 253 FLUID MECHANICS LAB

L	T	P	Credits
0	0	2	1.0

1. To determine the Reynolds's number and hence the type of flow
2. To determine co-efficient of discharge (c_d) for venturimeter and orifice meter & calibrate Rota meter
3. To determine the co-efficient of discharge (c_d) through different types of notches i.e. Rectangular & V- notch
4. To verify the Bernoulli's theorem
5. To determine the losses due to friction in pipes
6. To determine the coefficient of Pitot tube and plot the velocity profile across the cross section of pipe
7. To determine the Metacentric height & position of the metacenter with angle of heel for the ship model
8. To determine the co-efficient of discharge and co-efficient of velocity for Orifice & Mouthpiece

ਸਿਲੇਬਸ
ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ (ਮੁੱਢਲਾ ਗਿਆਨ)

ਅੰਡਰ ਗ੍ਰੈਜੂਏਟ ਪੱਧਰ ਤੇ ਪ੍ਰੋਫੈਸ਼ਨਲ ਕੋਰਸਾਂ ਲਈ ਕੁਆਲੀਫਾਇੰਗ ਪੰਜਾਬੀ (ਬੈਚ 2014 ਤੋਂ ਲਾਗੂ)

**For Other State Students of
B. Tech & 5 Yr. Engineering Management Integrated Program Only**

ਕੁੱਲ ਅੰਕ: 100 (ਮੋਖਿਕ ਪ੍ਰੀਖਿਆਂ 40 ਅੰਕ; ਬਾਹਰੀ ਪ੍ਰੀਖਿਆਂ 60 ਅੰਕ)

ਪਾਸ ਅੰਕ 35

ਸਮਾਂ : 3 ਘੰਟੇ

ਪੀਰੀਅਡ: 3 ਪ੍ਰਤੀ ਹਫ਼ਤਾ

ਭਾਗ ਓ

- 1) ਗੁਰਮੁਖੀ ਵਰਣਮਾਲਾ ਤੇ ਲੇਖਣ ਪ੍ਰਬੰਧ
ਓ) ਅੱਖਰ ਸਿੱਖਿਆ: ਤਰਤੀਬਵਾਰ ਤੇ ਭੁਲਾਵੇਂ ਅੱਖਰ
ਅ) ਅੱਖਰ ਬਣਤਰ: ਅੱਖਰ ਰੂਪ ਤੇ ਲਿਖਣ ਦੇ ਨਿਯਮ
- 2) ਗੁਰਮੁਖੀ ਅੱਖਰ ਤੇ ਪੰਜਾਬੀ ਧੁਨੀਆਂ ਦਾ ਪ੍ਰਬੰਧ
ਓ) ਸਵਰ ਤੇ ਵਿਅੰਜਨ: ਵਰਗੀਕਰਨ ਦੇ ਸਿਧਾਂਤ ਤੇ ਉਚਾਰਨ
ਅ) ਲਗਾਮਾਤਰਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋ

ਭਾਗ ਅ

- 1) ਲਿਪੀ ਦੇ ਅੱਖਰਾਂ ਦੀ ਵਰਤੋ ਦੇ ਨਿਯਮ
ਓ) ਪੂਰੇ ਤੇ ਅੱਧੇ ਅੱਖਰ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋ
ਅ) ਸਵਰ ਸੂਚਕ ਅੱਖਰਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋ
- 2) ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ ਨਾਲ ਜਾਣਪਛਾਣ।
ਓ) ਹਫ਼ਤੇ ਦੇ ਦਿਨ
ਅ) ਮਹੀਨਿਆਂ ਦੇ ਨਾਮ
ੲ) ਰੰਗਾਂ ਦੇ ਨਾਮ
ਸ) ਪੰਜਾਬੀ ਰਿਸ਼ਤਾਨਾਤਾ ਪ੍ਰਬੰਧ ਸ਼ਬਦਾਵਲੀ

ਭਾਗ ਏ

- 1) ਸ਼ਬਦ ਪ੍ਰਬੰਧ: ਸ਼ਬਦ ਜੋੜਾਂ ਦੀ ਵਰਤੋ
ਓ) ਦੋ ਅੱਖਰੀ ਸ਼ਬਦਾਂ ਦੇ ਸ਼ਬਦਜੋੜ
ਅ) ਤਿੰਨ ਅੱਖਰੀ ਸ਼ਬਦਾਂ ਦੇ ਸ਼ਬਦ ਜੋੜ
- 2) ਸ਼ਬਦਾਂ ਦੀਆਂ ਸ਼੍ਰੇਣੀਆਂ ਤੇ ਵਿਆਕਰਨਕ ਵਰਗਾਂ ਦੀ ਪਛਾਣ
ਓ) ਸ਼ਬਦਾਂ ਦੀਆਂ ਸ਼੍ਰੇਣੀਆਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋ, (ਨਾਵ, ਪੜਨਾਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ ਆਦਿ)

ਭਾਗ ਸ

- 1) ਸ਼ਬਦ ਬਣਤਰਾਂ ਤੇ ਵਿਆਕਰਨਕ ਇਕਾਈਆਂ ਦਾ ਸਿਧਾਂਤ ਤੇ ਵਰਤੋ
ਓ) ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰਾਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋ
(ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਸਮਾਸ, ਦੁਹਰਕਤੀ)
ਅ) ਵਿਆਕਰਨਕ ਇਕਾਈਆਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋ
(ਵਾਕੰਸ਼, ਉਪਵਾਕ ਤੇ ਵਾਕ)

ਅੰਡਰ ਗ੍ਰੈਜੂਏਟ ਪੱਧਰ ਤੇ ਪ੍ਰੋਫੈਸ਼ਨਲ ਕੋਰਸਾਂ ਲਈ ਕੁਆਲੀਫਾਇੰਗ ਪੰਜਾਬੀ
2013, 2014 ਅਤੇ 2015 ਪ੍ਰੀਖਿਆਵਾਂ ਲਈ
ਸਿਲੇਬਸ

ਕੁਲ ਸਮਾਂ:100

ਲਿਖਤੀ:60 ਅੰਕ

ਸਮਾਂ:3 ਘੰਟੇ

ਮੌਖਿਕ ਪ੍ਰੀਖਿਆ:40 ਅੰਕ

ਪੀਰੀਅਡ: 3 ਪ੍ਰਤੀ ਹਫ਼ਤਾ

ਪਾਸ ਅੰਕ:35%

1. ਪੰਜਾਬੀ ਦੀ ਪਾਠਪੁਸਤਕ

(ਮੁੱਖ ਸੰਪਾਦਕ: ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਪ੍ਰਕਾਸ਼ਕ ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ)

ਭਾਗ ਪਹਿਲਾ ਪੰਜਾਬੀ ਸਾਹਿਤ

(ੳ) ਕਵਿਤਾ

(ਅ) ਕਹਾਣੀ

(ੲ) ਨਾਟਕ

ਭਾਗ ਦੂਜਾ ਪੰਜਾਬ ਸਭਿਆਚਾਰ ਅਤੇ ਲੋਕਧਾਰਾ

ਭਾਗ ਤੀਜਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ

ਅੰਕ ਵੰਡ ਅਤੇ ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ

ਪੁਸਤਕ ਦੇ ਤਿੰਨ ਭਾਗ ਹਨ। ਪ੍ਰੰਤੂ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੋ ਭਾਗਾਂ ਵਿਚ ਹੋਵੇਗਾ। ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦਾ ਪਹਿਲਾ ਭਾਗ ਪੁਸਤਕ ਦੇ ਪਹਿਲੇ ਭਾਗ ਉਤੇ ਆਧਾਰਿਤ ਹੋਵੇਗਾ। ਇਸ ਭਾਗ ਦੇ ਕੁਲ 36 ਅੰਕ ਹਨ। ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦਾ ਦੂਜਾ ਭਾਗ ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਅਤੇ ਤੀਜੇ ਭਾਗ ਉਤੇ ਅਧਾਰਿਤ ਹੋਵੇਗਾ। ਇਸ ਭਾਗ ਦੇ ਕੁਲ 24 ਅੰਕ ਹੋਣਗੇ ਅਤੇ ਇਸ ਵਿਚ ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਅਤੇ ਤੀਜੇ ਭਾਗ ਦੇ 1212 ਅੰਕ ਹੋਣਗੇ।

(1) ਪੁਸਤਕ ਦੇ ਪਹਿਲੇ ਭਾਗ ਦੇ ਤਿੰਨ ਉਪਭਾਗ ੳ, ਅ ਅਤੇ ੲ ਹਨ। ਇਨ੍ਹਾਂ ਤਿੰਨਾਂ ਉਪਭਾਗਾਂ ਵਿਚੋਂ ਹੇਠ ਅਨੁਸਾਰ ਸੁਆਲ ਪੁੱਛੇ ਜਾਣ।

(ੳ) ਇਸ ਵਿਚ ਕੁਲ 12 ਪ੍ਰਸ਼ਨ ਐਂਬਜੈਕਟਿਵ ਟਾਈਪ/ਮਲਟੀਪਲ ਚੋਣ ਵਾਲੇ ਹੋਣਗੇ। ਹਰ ਉਪਭਾਗ ਵਿਚੋਂ 4 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਅੰਕ $3 \times 4 = 12$

(ਅ) ਹਰ ਉਪ ਭਾਗ ਵਿਚੋਂ 5--5 ਲਘੂ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਹਰ ਭਾਗ ਵਿਚੋਂ 3 ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਉੱਤਰ ਪੰਜ ਲਾਈਨਾਂ ਤੋਂ ਵੱਧ ਨਾ ਹੋਵੇ। ਅੰਕ $9 \times 2 = 18$

(ੲ) ਹਰ ਉਪ ਭਾਗ ਵਿਚੋਂ 1 ਪ੍ਰਸ਼ਨ ਪੁਛਿਆ ਜਾਵੇਗਾ। ਇਨ੍ਹਾਂ ਵਿਚੋਂ ਕੋਈ ਇਕ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨਾ ਹੋਵੇਗਾ। ਉੱਤਰ ਇਕ ਸਫੇ ਤੱਕ ਸੀਮਤ ਹੋਵੇ। ਅੰਕ = 06

(2) ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਅਤੇ ਤੀਜੇ ਭਾਗ ਵਿਚੋਂ ਪ੍ਰਸ਼ਨ ਇਸ ਪ੍ਰਕਾਰ ਪੁੱਛੇ ਜਾਣਗੇ।

(ੳ) ਹਰ ਭਾਗ ਵਿਚੋਂ 4 ਪ੍ਰਸ਼ਨ ਐਂਬਜੈਕਟਿਵ ਟਾਈਪ/ਮਲਟੀਪਲ ਚੋਣ ਵਾਲੇ ਹੋਣਗੇ। ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਅੰਕ $4+4 = 8$

(ਅ) ਹਰ ਇਕ ਭਾਗ ਵਿਚ 4 ਸੰਖੇਪ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। 8 ਪ੍ਰਸ਼ਨਾਂ ਵਿਚੋਂ ਕੁਲ 5 ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ 2 ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹਨ। ਅੰਕ $5 \times 2 = 10$

(ੲ) ਹਰ ਇਕ ਭਾਗ ਵਿਚੋਂ 1 ਪ੍ਰਸ਼ਨ ਪੁਛਿਆ ਜਾਵੇਗਾ। ਇਨ੍ਹਾਂ ਵਿਚੋਂ ਕੋਈ ਇਕ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨਾ ਹੋਵੇਗਾ। ਉੱਤਰ ਇਕ ਸਫੇ ਤੱਕ ਸੀਮਤ ਹੋਵੇ। ਅੰਕ = 06

ਨੋਟ: ਮੌਖਿਕ ਪ੍ਰੀਖਿਆ ਪਾਠਪੁਸਤਕ ਤੇ ਹੀ ਅਧਾਰਿਤ ਹੋਵੇਗੀ। ਇਸ ਦੀ ਵਿਧੀ ਪ੍ਰੈਕਟੀਕਲ ਵਾਲੀ ਹੋਵੇਗੀ।

B.TECH. SECOND YEAR

(CIVIL ENGINEERING)

(Batch 2015)

(Session 2016-2017)

SCHEME OF PAPERS

FOURTH SEMESTER (Civil Engineering)

Sr.No.	Course No.	Title	L	T	P	Credits
1.	BAS 201	Numerical Methods and Applications	3	1	0	3.5
2.	CVE 207	Survey-II	3	1	0	3.5
3.	CVE 208	Structure Analysis - I	3	1	0	3.5
4.	CVE 209	Rock Mechanics & Engineering Geology	3	1	0	3.5
5.	CVE 210	Concrete Technology	3	1	0	3.5
6.	CVE 211	Construction Machinery and Works Management	3	1	0	3.5
7.	BAS 251	Numerical Methods and Applications Lab*	3	1	0	3.5
8.	CVE 254	Survey –II Lab*	0	0	2	1.0
9.	CVE 255	Solid Mechanics Lab*	0	0	2	1.0
			0	0	2	1.0
		Environmental and road safety awareness				
			18	6	6	24.0

* BAS 251, CVE 254 and CVE 255 are practical papers only.
There will not be any theory examination for these papers.

- In addition to above mentioned subjects, there will be an additional course on Environmental and road safety awareness as a qualifying subject

Department of Civil Engineering

Punjabi University, Patiala.

General Instructions to the Paper Setters

(Common for B.Tech. in Computer Engineering, Electronics and communication Engineering, Mechanical Engineering, Civil Engineering and Integrated BTech/MBA Branches)

Applicable to 2015 Batch

The B. Tech paper structure will be as shown below:

Pattern of Question Paper	
TITLE OF SUBJECT (CODE----	
Bachelor of Technology (Branch) Section:	
End Semester Exam	
TIME ALLOWED: 3 Hour	Roll. No.....
Maximum Marks: 50	
Note:- Attempt any Six questions selecting three questions from each section A and B. Section C is compulsory.	
Section-A (From Section A of the syllabus)	
Q1.	
Q2.	
Q3.	
Q4.	3x5
Q5.	
Section-B (From Section B of the syllabus)	
Q6.	
Q7.	
Q8.	
Q9.	
Q10.	3x5
Section-C (Common from Whole of the Syllabus)	
Q11	
a).....	
b)	
c)	
d)	
e)	
f)	
g)	
h)	
i)	
j).....	10x2=20

Note for the paper setter:

1. Numbers of questions to be set are nine (11) as per the above format.
2. Section A and B contain 10 questions of (5) marks each.
3. Section C is compulsory and contains ten sub-parts of one mark each. The answers for each question should preferably be of 2 to 3 lines.
4. The maximum limit on numerical questions to be set in the paper is 35% while minimum limit is 20% except theoretical, analysis and design papers
5. The paper setter shall provide detailed marking instructions and solution to numerical problems for evaluation purpose in the separate white envelopes provided for solutions.
6. The paper setters should seal the internal & external envelope properly with signatures & cello tape at proper place.
7. Log tables, charts, graphs, Design data tables etc. should be specified, whenever needed.
8. Use of Scientific calculator should be clearly specified.
9. There are some MBA subjects (like BAS 202 Operational Research, MBA 5011 Foundation of Financial Accounting, MBA 5012 Foundation of Managerial Accounting, MBA 5022 Foundations of Marketing, MBA 5023 Foundations of Law, MBA 5031 Foundations of Macroeconomics, MBA 5032 Foundations of Microeconomics, MBA-5033 Foundations of International Business, MBA 5013 Foundations of Finance) where syllabus is not divided among four sections namely A, B,C,D then Question paper must be set by without specifying section in it and giving proper weightage to the respective portions.

BAS 201 NUMERICAL METHODS AND APPLICATIONS

L	T	P	Credits
3	1	0	3.5

Section-A

Solution of Algebraic and Transcendental Equations: Truncation error; Round-Off error; Absolute and Relative errors; Bisection method; Iteration method: Conditions for the convergence of the Iteration method, Acceleration of convergence-Aitken's δ^2 process; Newton-Raphson method: Conditions for the convergence; Comparison of Regula Falsi method and Secant method; Rate of convergence and geometrical representation of each method; Newton-Raphson method for system of non-linear equations.

Solution of system of non-homogeneous linear equations: Matrix inversion method; Gauss Elimination method: Partial and Complete Pivoting; Gauss Jordan Elimination method; Triangularization method; Factorization method; Jacobi's method and Gauss-Seidal's method. Solution of Tridiagonal system of equations.

Eigen values and Eigen vectors of a matrix: Eigen values of Transpose of matrix, inverse of matrix, Hermitian matrix and Similar matrices; Iterative Methods to find Eigen values and Eigen vectors: Power method and Jacobi method. Diagonalization of a matrix. Curve fitting: Method of Least Squares-fitting a straight line, a second degree parabola and exponential curves.

Section-B

Numerical Differentiation and Integration: Numerical Differentiation using finite differences, Numerical Integration; Newton-Cotes methods, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule.

Numerical Solution of Differential Equations: Numerical solution of first order ordinary differential equations using Taylor's series method; Picard's method; Euler's method; Improved Euler's method; Modified Euler's method; Runge-Kutta method of Second and Fourth order; Predictor-Corrector methods: Milne's method and Adam's method. Boundary values problems for ordinary differential equation by finite difference method.

RECOMMENDED BOOKS

1. Numerical Methods for Mathematics, Science and Engineering by Mathews, Prentice-Hall of India. Ed. Second.
2. Numerical Methods for Scientist and Engineering Computation by M. K. Jain, S. R. K. Iyengar and R. K. Jain, New Age International Publisher, Ed. Fourth.
3. Introductory Methods of Numerical Analysis by S. S. Sastry

CVE 207 SURVEY – II

L	T	P	Credits
3	1	0	3.5

Section-A

Theodolite: Different types of Theodolites, temporary & permanent adjustment, traversing with a Theodolite, adjustment of closing error by Bowditch & transit rules.

Curves: Different types of curves, their degree and calculation of ordinates, and angles, their layout obstacles in curves.

Tachometric Survey: Different types of tachometer, calculation of vertical and horizontal distances, substance bar. Tachometric leveling with both angle of depression and elevation, errors due to curvature & refraction.

Section-B

Triangulation: Measurement of baseline, corrections for the baseline, selection of stations.

Trigonometric Levelling: Height & distance of inaccessible objects.

GIS: Introduction, concepts and terminology, Utility of GIS, Essential components of a GIS, Data acquisition through scanners and digitizers, Data storage, Data manipulation and analysis Applications of GIS.

GPS: Introduction, working principle, various application of GPS related to Civil Engg., components of GPS – Point positioning and differential positioning.

Remote Sensing: Introduction, interaction of EMR with Earth Surface Working Principles and Instrumentation.

Recommended Books:

1. C.L. Kochher, Surveying, Danpat Rai & Sons
2. Kanetkar, T. P., Surveying Vol. I & II, Pune Vidhyarthi Griha Prakashan (1985).
3. P.B. Sahiwny, Surveying
4. Singh, Narinder, Surveying, Tata McGraw Hill (1992).
5. Punmia, B. C., Surveying Vol. I and II, Luxmi Publications (1998).
6. Agor, R., Surveying, Khanna Publishers (1982).
7. Venkataramiah, C., A Text Book of Surveying, Universities Press (1996).
8. Kaplan, E.D., Understanding GPS : Principles and applications
9. Campbell, J.B. Taylvor and Francis, "Introduction to Remote Sensing".

CVE 208 STRUCTURE ANALYSIS - I

L	T	P	Crédits
3	1	0	3.5

Section-A

INTRODUCTION: Classification of structure, support conditions, Equations of static equilibrium, Free body Diagram, Degree of static and kinematic indeterminacy, Maxwell reciprocal theorem, Betti law of reciprocal deflection, Castiglione theorem. Stiffness and flexibility of members

ANALYSIS OF DETERMINATE TRUSSES

Introduction: Determination of forces in member of trusses by method of joints, method of sections. Deflection of pin joint plane frame by unit load method.

ROLLING LOADS

Introduction to rolling loads and influence lines, Determination of shear force, bending moment at a section and absolute shear force and bending moment due to single point load, uniformly distributed load, several point loads etc.

INFLUENCE LINES

Construction of Influence lines for reaction, shear forces and bending moment for simply supported, overhauling and compound beams, influence lines for girders with floor beams, Influence lines for forces in members of frames. Influence lines for deflection.

Section-B

ARCHES

Introduction, Analysis of three hinged parabolic, circular and semicircular arch at same level and different level support. Influence lines for horizontal thrust, shear force and bending moment for three hinged arches. Nominal thrust and radial shear.

CABLES AND SUSPENSION BRIDGES

Introduction, shape of a loaded cable, cable carrying point loads and UDL, cables with ends at different level, cable subjected to temperature stresses, suspension bridge with two hinged and three hinged stiffening girders.

Analysis of Gravity dams, chimneys and Retaining Walls Introduction, limit of eccentricity for no tension in the section, core of the section, middle third rule, wind pressure on chimneys

SPACE FRAMES: Introduction, simple space truss, types of supports, equilibrium and stability conditions, and analysis of determinate and indeterminate space frames using tension coefficient method.

Recommended Books:

- 1 C.S. Reddy, Basic structural analysis, Tata McGraw Hill
- 2 C. K. Wang. Intermediate structural analysis, Tata McGraw Hill
- 3 B.C. Punima, Theory of structures, Lakshmi Pub. Delhi
- 4 Theory of structures – S. Ramamrutham, Dhanpat Rai Publication.

CVE 209 ROCK MECHANICS & ENGINEERING GEOLOGY

L	T	P	Credits
3	1	0	3.5

Section-A

General Geology: Importance of Engg. Geology applied to Civil Engg. Practices. Weathering, definition, types and effect. Geological works of rivers, wind, glaciers as agents of erosion, transportation and deposition.

Rocks & Minerals: Minerals, their identification igneous, sedimentary & metamorphic rocks. classification of rocks for engineering purposes. Rock quality designation (ROD)

Structural Geology: Brief idea about stratification, apparent dip, true dip, strike and in conformities.

Folds, faults & joints: definition, classification relation to engg. Operations.

Engineering Geology: Geological considerations in the Engg. Projects like tunnels, highways, foundation, dams, reservoirs.

Section-B

Earthquake: Definition, terminology, earthquake waves, intensity, recording of earthquake.

Engineering properties of rocks and laboratory measurement: Uniaxial compression test, tensile tests, permeability test, shear tests, size and shape of specimen rate of testing. Confining pressure, stress strain curves of typical rocks.

In-situ determination of Engg. Properties of Rock masses: Necessity of in-situ tests, uniaxial load tests in tunnels and open excavations, cable tests, flat jack test, shear test, pressure tunnel test. Simple methods of determining in situ stresses bore hole in-coring technique-bore hole deformation gauges.

Improvement in properties of Rock masses: Pressure grouting for dams and tunnels, rock reinforcement rock bolting.

Recommended Books:

- 1 Richard E. Goodman, Introduction to Rock Mechanics
- 2 Farmar, I.W., Engg. Behaviour of rocks
- 3 Jaager C., Rock Mechanics and Engg.
- 4 Jaager and Cook, Fundamentals of Rock Mechanics
- 5 D.S. Arora, Engineering Geology
- 6 Parbin Singh, Engineering Geology
- 7 B.P. Verma, Rock Mechanics for Engineering

CVE -210 CONCRETE TECHNOLOGY

L	T	P	Crédits
3	1	0	3.5

Section-A

Introduction - Concrete materials - Cement: Physical tests on cement - Concrete materials - Tests on aggregates - Quality of Water for mixing and curing - use of sea water for mixing concrete

Mix Design - factors influencing mix proportion - Mix design by ACI method and I.S. code method.

Admixtures - accelerating admixtures - Retarding admixtures - water reducing admixtures - Air entraining admixtures - coloring agent - Plasticizers. Batching - Mixing -Transportation - Placing of concrete - curing of Concrete

Repair technology: - symptoms, evaluation of crack, repair of crack, types of repair, underwater repair.

Section-B

Strength of Concrete - Shrinkage and temperature effects - creep of concrete - Corrosion - Causes and effects - remedial measures- Thermal properties of concrete - Micro cracking of concrete. Quality control of concrete

Introduction on Special Concrete - light weight concrete, Fiber reinforced concrete, Polymer-polymer modified concrete, ready mix concrete, Self compacting concrete.

Permeability and Durability: Permeability, sulphate attack, action of frost, frost resistance concrete.

Introduction on Pre stressed Concrete:- Basic concepts, classification and types of prestressing, prestressing systems, pretensioned and post-tensioned concrete elements. (No numerical)

BOOKS RECOMMENDED:

1. Shetty, M.S., Concrete Technology, Theory & Practice, S.Chand and Co, 2004.
2. Gambhir, M.L., Concrete Technology, Tata McGraw Hill, 2004.
3. Neville, Properties of Concrete, Longman Publishers, 2004.
4. Santakumar A.R., Concrete Technology, Oxford University Press, New Delhi, 2007.

CVE -211 CONSTRUCTION MACHINERY & WORKS MANAGEMENT

L	T	P	Crédits
3	1	0	3.5

Section-A

Introduction: Need for project planning & management, time, activity & event, bar chart, Milestone chart, uses & draw backs.

PERT: Construction of PERT network, time estimates, network analysis, forward pass & backward pass, slack, critical path, data reduction, suitability of PERT for research project, numerical problems.

CPM: Definitions, network construction, critical path, fundamental rules, determination of project schedule, activity time estimates, float types, their significance in project control, numerical problems.

Section - B

Cost Analysis and Contract: Type of costs, cost time relationships, cost slopes, conducting a crash programme, determining the minimum total cost of project, numerical problems. Updating a project, when to update, time grid diagram, resource scheduling. Planning of different components of civil engineering projects such as a house, workshop, dam, and tunnel.

Construction Equipment and Machinery: Tractors, bull dozers, rippers, scrappers, power shovels, dragline, hoes. Line diagram of each, sizes, output, uses, factors affecting selection of each equipment, economic life of equipment, maintenance and repair cost.

Hoisting & Transporting Equipments: Hosts, Winches, Cranes, Belt conveyors, Ropeways, trucks & Wagons. Plants for grading, batching, mixing, types of mixers, concrete pumps, bitumen plants.

BOOKS RECOMMENDED:

Construction Planning and Equipment - R.L.Peurifoy - Tata McGraw Hill, New Delhi

PERT and CPM - L.S.Srinath, East West Press

Management Guide to PERT & CPM - Wiest & levy; Prentice Hall

Construction Equipment & Planning and Application. - Mahesh Verma Artec Publication.

Construction Planning and Management by U. K. Shrivastava; Galgotia Publications Pvt. Ltd.

BAS 251 NUMERICAL METHODS AND APPLICATIONS LAB

	L	T	P	Credits
	0	0	2	1.0
1.	WAP to implement Regular Falsi Method			
2.	WAP to implement Secant Method			
3.	WAP to implement Newton – Raphson Method			
4.	WAP to implement Gauss – Elimination Method			
5.	WAP to implement Gauss – Seidal Method			
6.	WAP to implement Trapezoidal Rule			
7.	WAP to implement Simpson Rule			
8.	WAP to implement Euler’s Method			
9.	WAP to implement Runge – Kutta Method			
10.	WAP to implement Predictor Corrector Method			
11.	WAP to implement Power Method			

CVE – 254 Survey –II LAB

L	T	P	Cr
0	0	2	1.0

- 1.Measurement of horizontal angles using theodolite
- 2 Measurement of Vertical angles using theodolite.
- 3. Base line measurement.
- 4 Tachometric survey.

CVE 255 SOLID MECHANICS LAB

L	T	P	Credits
0	0	2	1.0

- 1. To determine Rockwell hardness number of the specimen of steel / soft metal
- 2. To determine Brinell hardness number of the specimen of steel / soft metal
- 3. To determine Vicker’s hardness number of the specimen of steel / soft metal
- 4. To determine the modulus of rigidity of a bar on torsion testing machine (destructive test)
- 5. To determine the impact strength of a specimen on Izod / Charpy impact testing machine
- 6. To determine the Young’s modulus of the material of a beam simply supported at the ends and carrying a concentrated load at the center
- 7. To determine the Young’s modulus of the a strip on tensile testing machine
- 8. To study the behaviour of the material on universal testing machine

Environmental and Road Safety Awareness

Time Allowed : 3 hours
Total lectures : 50
Pass marks : 35

Total Marks : 100

Instructions

- a) The paper has been introduced from the session 2013-14.
- b) The paper will be taught in the Second year/fourth Semester of all the U.G. Courses (B.A., B.Com., B.Sc., Law, Engineering, Commerce, Agriculture etc.) except LL.B. three year course and will be a qualifying paper only. The marks of this paper will not be counted towards final score of the under graduate degree.
- c) This will cover only preliminary and basics of the subject and the paper will be set accordingly.
- d) The written paper will have two parts. Each part of the paper will be of 50 marks and will contain ten questions. The candidates will attempt five questions out of each part. The answer to each question should not exceed 500 words. Each question will carry ten marks.

Section – I

Unit 1 : The multidisciplinary nature of environmental studies. Definition, scope and importance

- Concept of Biosphere – Lithosphere, Hydrosphere, Atmosphere.
- Need for public awareness (6 lectures)

Unit – 2 Natural Resources – Renewable and non-renewable resources.

- Natural resources and associated problems.
 - a) Forest resources : use and over exploitation, deforestation and its impact.
 - b) Water resources ; use and overutilization of surface and ground water and its impact.
 - c) Mineral resources : use and effects on environment on over exploitation.
 - d) Food resources : Effects modern agriculture, fertilizer-pesticide problem, water logging and salinity.
 - e) Energy resources : Growing energy needs, renewable and non-renewable energy sources, use of alternate energy resources.
 - f) Role of an individual in conservation of natural resources for sustainable development.
- (7 lectures)

Unit 3 : Ecosystems

- Ecosystem and its components : Definition, structure and function; producer, consumer and decomposer.
- Types of Ecosystem (Introduction only)
- Food Chains, food web and ecological pyramids (6 lectures)

Unit – 4 : Biodiversity and conservation

- Introduction – Definition : genetic, species and ecosystem diversity, value of biodiversity.
- Hot spots of biodiversity
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India.

- Conservation of Biodiversity. (6 lectures)

Section – II

Units 5 : Environmental Pollution

- Definition, causes, effects and control measures of
 - a) Air pollution
 - b) Water pollution
 - c) Soil pollution
 - d) Marine pollution
 - e) Noise pollution
 - f) Thermal pollution
 - g) Nuclear hazard
- Role of an individual in prevention of pollution.
- Solid waste management : vermicomposting.
- Disaster management : Floods, earthquake, cyclone and landslides (7 lectures)

Unit 6 : Social Issues and the Environment

- Urban problems related to energy.
- Water conservation rain water harvesting, water shed management.
- Resettlement and rehabilitation of people : its problems and concerns.
- Climate changes, global warming, acid rain, ozone layer depletion.
- Consumerism and waste products.
- Population explosion – Family welfare programme (6 lectures)

Unit 7 : Introduction to Environmental Protection Laws in India

- Environmental Protection Act.
- Air (Prevention and control of pollution) Act.
- Water (Prevention and Control of pollution) Act.
- Wild life Protection Act.
- Forest Conservation Act.
- Issues involved in the enforcement of environmental legislation. (6 lectures)

Unit 8 : Road safety Awareness

- Concept and significance of Road safety.
- Traffic signs.
- Traffic rules.
- Traffic Offences and penalties.
- How to obtain license.
- Role of first aid in Road Safety. (6 lectures)