



VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

F.Y. B.Sc. Computer Science

ENGLISH (Higher Level)

Unit No.	Topic
	Text - A spectrum of English Writing
1	SPORTS
	1.1 Our Young Don3 1.2 Uncle Ken at the Wicket
2	LETTERS
	2.1 A Letter to a Well-Intentioned Parent 2.2 A Daughter writes to her father
3	USE OF TECHNOLOGY
	3.1 Methyl Bromide 3.2 New Vaccines
4	ENVIRONMENT
	4.1 Cleaner Cities 4.2 The Tuskers Trial
5	SCIENCE
	5.1 Superstition must give way to Science 5.2 The life cycle of a mosquito
6	EDUCATION
	6.1 Best Teacher I ever had 6.2 The Legacy
7	INTERVIEWS
	7.1 Soul Search 7.2 Ratan Tata
8	ADVERTISING
	8.1 100 Years of Auto Advertising 8.2 Some more ads
9	Women
	9.1 Educating Amina 9.2 The Lady or the tiger
10	STRUGGLE FOR FREEDOM
	10.1 The Birth of Satyagrah 10.2 Sardar Patel
	Text – Strengthen your English by M.P. Bhaskaran & D.horsburgh
11	Basic Grammar
12	Phonetics

ENVIRONMENTAL STUDIES

Unit No.	Topic
1	Natural Resources
	<p>1.1 Forest: Past and the present status. Exploitation pressure, threats, conservation measures. Forest as a reservoir of biodiversity. Forest as a renewable source. Problems of monoculture.</p> <p>1.2 Water: Water cycle, Types of water sheds. Marine, Rivers, Ponds & Lakes underground. Dams and their social and Environmental impact, over utilization of water and consequences, Recharging and conversation.</p> <p>1.3 Mineral: Uses, Exploitation and further projections. Mines and minerals. Impact on Environment.</p> <p>1.4 Food: Food for humanity and Pets (Poultry, cattle) Problems and processes of food production.</p> <p>1.5 Cultivars: diversity Vs. monocultures, Aspects of modern Agro industry: high yielding varieties, fertilizers vs. Manures, irrigation and water logging, pesticides.</p> <p>1.6 Energy: Renewable & non renewable energy resources. Alternative sources of energy. Limitations and impact of fossil fuels.</p> <p>1.7 Land: Present status of land use pattern arable, fallow, user lands. Land degradation, soil erosion, desertification, conservation measures wasteland reclamation.</p>
2	Ecosystems
	<p>2.1 Concept and types of the Ecosystems.</p> <p>2.2 Procedures, Consumers and decomposers.</p> <p>2.3 Energy flow in ecosystem</p> <p>2.4 Ecological succession.</p> <p>2.5 Food chains, food webs and ecological pyramids.</p> <p>2.6 Introduction and features of ecosystems:</p> <p>2.6.1 Forest ecosystem</p> <p>2.6.2 Desert ecosystem</p> <p>2.6.3 Aquatic ecosystems</p>
3	Productivity and its conservation
	<p>3.1 Concepts, types</p> <p>3.2 Importance of diversity</p> <p>3.3 Mega biodiversity centers & Biodiversity hot Spot</p> <p>3.4 Status of Biodiversity in India and Gujarat</p> <p>3.5 Threats of Biodiversity</p> <p>3.6 Concept of Threaten, vulnerable and rare Species</p> <p>3.7 Measures of conservation: In situ and ex-situ conservation of Diversity</p>
4	Environmental Pollution
	<p>4.1 Causes and effects of pollution for.....</p> <p>4.1 Air (including thermal changes, acid rains, ozone layer depletion)</p> <p>4.2 Water – Marine & fresh waters</p> <p>4.3 Land</p> <p>4.4 Noise</p> <p>4.5 Nuclear hazards and radiation pollution</p> <p>4.2 Effects of urbanization: Congestion, solid waste management.</p>

	<p>4.3 Effects of Industrialization</p> <p>4.4 Disasters: Types, causes, management.</p> <p>4.5 Case study: Earthquake, Bhopal, Japan A- bomb explosion.</p>
5	Human population and the Environment
	<p>5.1 Population growth: world scenario with emphasis on Indian scenario</p> <p>5.2 Women and child welfare</p> <p>5.3 Environment and human health</p> <p>5.4 Epidemic and endemic diseases with reference to environmental degradation (Malaria, Typhoid, Diarrhoea, Dysentery, cholera., Rickettsia,</p> <p>5.5 Role of information Technology in Environment and human health.</p>
6	Society, Government and Environment
	<p>6.1 Concept of sustainable development and the bearing capacity of</p> <p>6.2 Problems of development Migration ,and unbalancing (villages Vs. cities) Rehabilitation of displaced Communities.</p> <p>6.3 Environmental ethics: Issues and possible solutions.</p> <p>6.4 Environment Protection Act</p> <p>6.5 Air (Prevention and control of pollution) Act:</p> <p>6.6 Water (Prevention and control of pollution) Act:</p> <p>6.7 Wild life Protection Act</p> <p>6.8 Forest conservation and Biodiversity Protection act</p> <p>6.9 Public awareness and human rights</p> <p>6.10 Case studies on Environmental molestation and Peoples Triumph (Silent valley, chipko andolan)</p> <p>6.11 Global Earth summits</p>
7	Social awareness and participatory Environmental protection as social Responsibility.
	<p>7.1 Role of individuals, NGOs and other social institutions like universities,Schools,Housing societies, residential settlements and colonies of industries towards following issues.</p> <p>7.1.1 Illicit cutting of Trees and killing of wild animals. .</p> <p>7.1.2 Green belt near residential society, villages and factory,school, cemetery, Crematorium.</p> <p>7.1.3 Effluent leakage (Pollution by factories or sewage in the town).</p> <p>7.1.4 Dirt-litter accumulation in the street</p> <p>7.1.5 Noise near hospitals and noisy industry near residential areas.</p> <p>7.1.6 Foul smell and eye irritation.</p> <p>7.1.7 Dying fishes and water shed banks.</p> <p>7.1.8 Well and river water getting stained due to water pollution.</p> <p>7.1.9 Pilferage of electricity.</p>
8	Remedial measures and protection strategies:
	<p>8.1 control of air and water borne diseases created especially due to pollutionFood contamination by</p>

	<ul style="list-style-type: none">: Heavy metals: Organic poisons & pesticides: Radio active isotopes <p>8.2 Noise abatement</p> <p>8.3 Water treatment and purification for gray water & Black water.</p> <p>8.4 Industrial waste reduction and treatment plants.</p>

Fundamentals of Computer Architecture, Database & web page designing Paper-I

Unit No.	Topic
1	Computer Fundamentals
	1.1 History, Characteristics and Generation of Computers 1.2 Classification of Hardware and Software 1.3 Basic knowledge about CPU, Control Unit, ALU (Concepts only) 1.4 Memory: Primary Memory, secondary memory 1.5 Storage Devices, (HDD, CD-ROM, DVD) 1.6 I/O devices (key board, mouse, scanner, plotter, ocr, omr, cd-drive, joy stick) 1.7 Display Devices (VDU, LCD, Touch screen, TFT) 1.8 Types of printers: (Impact and non-Impact)
2	Number System
	Decimal, Binary, Octal, & Hexa Conversion of numbers to other systems Arithmetic operation of Binary Number System (Addition & Subtraction)
3	Operating System
	3.1 What is Operating System, Types of O.S. (Single user, Multi-User/CUI-GUI) 3.2 Loading process of Os 3.3 BIOS, POST Operation. Vector table, Device Drivers, TSR programs 3.4 System Files, Configuration files 3.5 Disk architecture. (FAT, FAT32, NTFS) 3.6 DOS Internal & External Commands and equivalent Unix commands
4	Introduction of Internet
	4.1 What is Internet? History of Internet. 4.2 Introduction of Modem, Router and Gateway 4.3 Concepts of ISP, DNS server, Browser, WWW, Webpage, Domain name and IP address 4.4 Advantages of E-mail, E-mail address and mail-boxes, working of e-mail 4.5 Concept of Browser, Search Engine, Telnet, FTP, IRC (Internet Relay Chat)
5	HTML and its working:
	5.1 Introduction to URL (Fragment identifier, Relative URL) 5.2 History of HTML, SGML 5.3 Structuring Web-page, Paragraph and line break tags 5.4 Adding comments, formatting text, creating Lists (OL, UL) 5.5 Creating definition lists, creating hypertext links 5.6 Creating link lists, inserting images and object 5.7 Creating image links, Horizontal rules, Address tags 5.8 Font sizes and colors, background image, marquee tag 5.9 Tables, frames and creating forms 5.10 Concepts of uploading the web-site
6	Database and its concepts

	6.1 Concepts of field, record, table and database 6.2 Comparison between manual and file system 6.3 Need and organization of database (physical, conceptual, logical) 6.4 Keys-primary key, foreign key, composite key
7	Working of MS-Access –Basic and concepts:
	7.1 Working with databases & tables 7.2 Managing constraints & relationships 7.3 Create forms & reports 7.4 Using SQL Queries(Simple, join, subquery, view)

Programming in C

Paper : II

Unit No.	Topic
1.	1. Programming Methodology
	1.1. Algorithm and flowchart 1.2. Levels of programming languages 1.3. Structured programming 1.4. Compiler/Interpreter 1.5. Program bugs and testing
2	2. Fundamentals of 'C'
	2.1. The Basic of 'C' 2.1.1 Identifiers, Keywords, Data 2.1.2 Types, Declaration. Reserved Words 2.2. Operators and Expressions 2.3. Arithmetic Operators 2.3.1. Unary Operators 2.3.2. Relational Operators 2.3.3. Assignment Operators 2.3.4. Conditional Operators 2.3.5. Bit-wise Operators
3	3. Various Header Files and I/O Functions
4	4. Control Statements
	4.1 While, Do.... While, for, if...else, switch, break, continue
5	5. Functions
	5.1. Library Functions 5.2. User Defined Functions 5.2.1. Definitions and Accessing of the Function 5.2.2. Passing Arguments to a Function 5.2.3. Specifying Argument data type 5.2.4. Function Prototype 5.2.5. Recursion
6	Array
	Array definitions, processing an array, passing array to function, multi dimensional array,
7	Pointers
	7.1 Pointer fundamentals 7.2 Pointer Declaration 7.3 Passing Pointer to a function 7.4 Pointers and one dimensional array 7.5 Pointers and Multidimensional Array Array of Pointer Passing function to other functions
8	Structures And Unions
	8.1 Defining Structure 8.2 Processing a Structure 8.3 User Defined Data Types (typedef) 8.4 Structure and Pointer 8.5 Passing structure to a function 8.6 Self referential Structure

	8.7 Unions
9	Files
	9.1 Opening a file & Closing a file 9.2 Reading from a file & Writing to a file 9.3 Reading and writing structures 9.4 Random Accessing a file
10	PREPROCESSOR
	10.1 # and ## operator 10.2 Preprocessor statements 10.3 Macro definitions

MATHEMATICS
TRIGONOMETRY, MATRICES AND VECTOR CALCULUS
Paper I

Unit No.	Topic
1	TRIGONOMETRY
	1.1 De'Moivre's theorem and its applications 1.2 Hyperbolic functions of real variables 1.3 Circular and Hyperbolic functions of complex variables 1.4 Logarithms of complex quantities, Expansion of Trigonometric and Exponential functions.
2	MATRICES
	2.1 Matrices 2.2 Definitions 2.3 Different types pf matrices 2.4 Operations on matrices 2.5 Addition and Multiplication of two matrices 2.6 Scalar multiplication, Properties of operations of matrices 2.7 Elementary row operations 2.8 Row-reduced echelon form 2.9 Linear independence of Rows 2.10 Row rank 2.11 Rank of matrix 2.12 Inverse of matrix 2.13 Characteristic equation of a matrix 2.14 Cayley- Hamilton theorem and its application to find inverse of a matrix
3	VECTOR CALCULUS
	3.1 Orientation of Vectors. 3.2 Vector differentiation and their properties 3.3 Gradient of a scalar functions 3.4 Divergence and curl of vector functions 3.5 Their properties.

MATHEMATICS
CALCULUS AND DIFFERENTIAL EQUATIONS
Paper II

Unit No.	Topic
1	DIFFERENTIAL CALCULUS
	1.1 Successive differentiation: 1.1.1 Calculation of nth derivatives of some standard functions (rational functions and product of powers of sine & cosine functions) 1.1.2 Leibnitz theorem. 1.2 Mean Value Theorem: 1.2.1 Rolle's and Lagrange's theorem & their geometrical interpretations 1.2.2 Cauchy theorem 1.2.3 Indeterminate forms 1.2.4 L'Hospital Rule 1.2.5 Maclaurin & Taylor series expansions. 1.3 Curvature 1.4 Test of Convexity 1.5 Points Of Inflexion 1.6 Asymptotes.
2	INTEGRAL CALCULUS
	2.1 Reduction formula for integration of 2.1.1 $\sin^n x$ 2.1.2 $\cos^n x$ 2.1.3 $\tan^n x$ 2.1.4 $\cot^n x$ 2.1.5 $\sec^n x$ 2.1.6 $\operatorname{cosec}^n x$ 2.1.7 $\sin^p x$ 2.1.8 $\cos^q x$ 2.1.9 $x^m \cos nx$ 2.1.10 $x^m \sin nx$
3	ORDINARY DIFFERENTIAL EQUATIONS
	3.1 Equations of first order and first degree: 3.1.1 Equations having separable variables 3.1.2 Homogeneous equations 3.1.3 Exact equations 3.1.4 Linear equations and Bernoulli's equations. 3.2 Differential equations of first order and higher degree 3.2.1 Solvable for x, y, p, Lagrange's equation 3.2.2 Clairaut's equation.

Physics Paper-I

Unit No.	Topic
1	1.1 Mechanics
	1.1.1 Rest and motion, reference frame. 1.1.2 Newton's laws of motion and their limitations, 1.1.3 inertial frame of reference, 1.1.4 Application of Newton's Laws – projectile DSM : 2.1 to 2.5, 4.2 1.1.5 Rigid body- translational and rotational motion, 1.1.6 Torque, 1.1.7 Angular momentum, 1.1.8 Moment of inertia-radius of gyration, 1.1.9 Dimensions and units of moment of inertia analogous parameters in translational and rotational motion 1.1.10 General theorems on moment of inertia, 1.1.11 Calculation of moment of inertia, particular cases of moment of inertia. DSM: 10.1 to 10.9
2	2.1 Properties of Matter
	2.1.1 Elastic moduli, 2.1.2 Poisson's ratio, limiting values of Poisson's ratio, 2.1.3 Elastic constants and their relationships. 2.1.4 Bending of beams and Cantilever DSM POM: 8.12 to 8.18, 8.29 and 8.30.
	2.2 WAVE MOTION
	2.2.1 Wave motion. What propagates in wave motion?, 2.2.2 Characteristics of wave motion, 2.2.3 Transverse wave motion, longitudinal wave motion, Definitions, relations between frequency and wavelength 2.1.4 Properties of longitudinal progressive waves, equation of SH waves Differential equation of wave motion, Particle velocity wave velocity, distribution of plane progressive waves, energy of progressive waves. Ref: SB (W&O): 4.1 to 4.8, 4.11 to 4.15
3	3.1 OSCILLATIONS
	3.1.1 Lissajous figures, 3.1.2 Composition of two S H M in a straight line, 3.1.3 Composition of two simple harmonic vibration of equal time periods acting at right angles, 3.1.4 Composition of two simple harmonic motion at right angles to each other having time periods in the ratio 1:2, 3.1.5 Experimental methods for obtaining Lissajous figures, 3.1.6 Uses of Lissajous figures. Ref: SB (W&O): 2.1,2.2,2.4, 2.6,2.8 and 2.9
	3.2 ULTRASONIC
	3.2.1 Ultrasonics, production of ultrasonic waves, detection of ultrasonic waves, applications of ultrasonic waves. Ref: SB(W&O) 11.23 to 11.25,11.27.
4	4.1 HEAT & THERMODYNAMICS

	4.1.1 Entropy and the second law of thermodynamics, 4.1.2 Entropy changes of closed system during an irreversible process, 4.1.3 Entropy, 4.1.4 Change in a reversible process(Carnot's cycle), 4.1.5 Change in entropy in an irreversible process, 4.1.6 Third law of thermodynamics, 4.1.7 Temperature entropy diagram, entropy of a perfect gas, 4.1.8 Zero point energy, negative temperatures Ref: SB(H&T) – 6.42 to 6.51
5	ATOMIC AND NUCLEAR PHYSICS
	5.1.1 Radioactivity: Soddy Fajan's Displacement laws, Laws of radioactive 5.1.2 Ddisintegration, the mean life, laws of successive disintegration, radioactive dating 5.1.3 Biological effects of nuclear radiations. Ref: RM- 31.29 to 31.31, 31.34 to 31.36 5.1.4 X-rays: introduction, production of X-rays 5.1.5 The absorption of X-rays, X-ray space absorption edges, 5.1.6 Bragg's law, the Bragg's X-ray Spectrometer 5.1.7 X-ray spectra, Characteristic X-ray spectrum 5.1.8 Moseley's law. Ref: RM – 7.1, 7.2,7.4 to 7.7, 7.11 to 7.13

Physics Paper II

Unit No.	Topic
1	1.1 VECTORS
	1.1.1 Product of vectors, 1.1.2 Vector product of a vector. A with the sum of two vectors B and C 1.1.3 Product of three and four vectors 1.1.4 Differentiation of vectors 1.1.5 Differentiation rules 1.1.6 Partial differentiation 1.1.7 Scalar and vector field 1.1.8 Gradient of a scalar field 1.1.9 Divergence of a vector field 1.1.10 Curl of a vector field 1.1.11 Important vector relationships. Vector integration 1.1.12 Statement of Gauss divergence theorem. stokes theorem, Ref: R –1.9 to 1.19, 1.22 to 1.24
	1.2 ELECTROSTATICS
	1.2.1 The conservative nature of electrostatic field, 1.2.2 Electric potential energy I definition of electric potential, 1.2.3 Principle of superposition of potential, 1.2.4 Poisson's and Laplace's equations. Ref: SCS - 4.2, 4.3, 4.10, 4.24
2	2.1 CURRENTS AND MAGNETOSTATICS
	<u>2.1.1</u> <u>Transients currents:</u> the growth and decay of current in an inductive circuit, <u>2.1.2</u> The charge and discharge of a capacitor through a resistance, <u>2.1.3</u> The physics of the LC oscillator, <u>2.1.4</u> Circuit with inductance, capacitance and resistance: charging process of the capacitor I the discharge of the capacitor in a series LCR circuit, <u>2.1.5</u> Logarithmic decrement of the circuit. Ref: SCS -17.3 to 17.9
	2.2 MAGNETIC INDUCTION
	2.2.1 Definition, Sources of magnetic induction B 2.2.2 Some properties of magnetic induction B 2.2.3 Ampere's law, definition of ampere, magnetic dipole, Ref: RM - 7.1 to 7.3, 7.5, 7.7, 7.9
3	3.1 ELECTRONICS (DIODES)
	3.1.1 Current voltage characteristics of semiconductor diode, 3.1.2 Resistance of semiconductor diode 3.1.3 Breakdown mechanism. Zener diode 3.1.4 Zener diode as a voltage regulator 3.1.5 Single phase full wave bridge rectifier 3.1.6 Filters. Ref: BS - 2.6,2.8,2.9 to 2.11,2.15,2.16. 3.1.7 Clipping circuits, applications of clippers, 3.1.8 Clamping circuits, basic idea of a clamper; 3.1.9 Positive clamper, negative clamper. Ref: VKM - 20.18 to 20.23. 3.1.10 LED,Photodiode, Ref:M-5.8
4	4.1 ELECTRONICS (TRANSISTORS)

	<p>4.1.1 Introduction, Construction of a junction transistor, 4.1.2 Operation of PNP transistor, 4.1.3 Operation of NPN transistor, 4.1.4 Supply voltage connections, 4.1.5 Current amplification factors. 4.1.6 Characteristic curves of a transistor in CE connection and definitions of the h parameters. Ref: BS – 3.2 to 3.6,3.8</p>
	4.2 DIGITAL ELECTRONICS(Logic circuits)
	<p>4.2.1 Introduction, 4.2.2 The AND gate, 4.2.3 The OR gate, 4.2.4 The NOT gate, 4.2.5 The NAND gate. Ref. BS- 13.1 to 13.9</p>
	4.3 ELECTRIC AND MAGNETIC INSTRUMENTS:
	<p>4.3.1 Tangent Galvanometer, 4.3.2 The D'Arsonval moving coil Galvanometer, 4.3.3 The construction of the pivoted moving coil galvanometer, 4.3.4 The merits and the demerits of moving coil galvanometer. Ref: SCS- 11.2,11.6,11.8,11.9</p>
5	5.1 OPTICS:
	<p>5.1.1 Geometrical optics: Image formation: Equivalent focal length of two thin lenses separated by a finite distance, 5.1.2 Power of a lens, 5.1.3 Cardinal points of an optical system, Principal foci and focal planes, principal points and principal planes, nodal points 5.1.4 Refraction through a thick lens, 5.1.5 Power of a thick lens. Ref: SB(O) 2.6 to 2.11,2.15,2.16 5.2 Physical optics: Review of interference: introduction, 5.2.1 Young's experiment, coherent sources, 5.2.2 Interference in thin films, interference due to reflected light (thin films), 5.2.3 Interference due to transmitted light(thin film), 5.2.4 Fringes produced by a wedge shaped thin film, 5.2.5 Newton's rings, determination of wavelength of sodium light using Newton's ring. Ref : SB(O): 8.1 to 8.3,8.15 to 8.17,8.21,8.23, 8.24</p>

PHYSICS PRACTICAL

NO.	GROUP – A
1	Moment of inertia by Torsional pendulum
2	Verification of parallel axis theorem
3	Verification of perpendicular axis theorem
4	Elastic constants by Searl's method.
5	' η ' by dynamic method
6	' η ' by static method.
7	Melde's experiment
8	Thermal conductivity of a bad conductor by Lee's method
9	Bending of a beam using cathetometer or traveling microscope (cantilever)
10	Bending of a beam supported at two ends and loaded in the middle.
11	Bifilar suspension
12	Sonometer determination of speed of transverse waves in wire.
13	Computer simulation of Lissajous figures. [D].
14	Computer simulation of projectile motion with and without resistive forces [D].
	GROUP – B
1	Cardinal points of a lens's system.
2	Newton's rings
3	Dispersive power of prism.
4	Low resistance by projection method.
5	Study of magnetic field due to a solenoid.
6	LCR Circuit.
7	Study of decay of current in CR circuit.
8	Conversion of a galvanometer into an ammeter and calibration by tangent galvanometer
9	Full and half wave rectifier.
10	Logic Gates.
11	Zener diode as voltage regulator.
12	Study of calculation of different types of errors (average, standard deviation and probable error)
13	Computer simulation of transistor amplifier [D].
14	Study of multimeter Digital and Analogue [D].