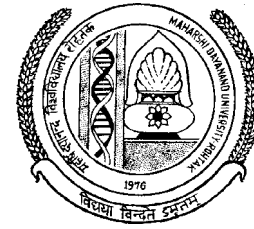# Maharshi Dayanand University
Rohtak

**Syllabus and Courses of Reading for
B.E. Computer Science & Engineering
(Semester VII & VIII)**

Session - 2010-2011

ELECTIVE PAPERS FOR BE 7th & 8th SEMESTER

HUM-451-E   **LANGUAGE SKILLS FOR ENGINEERS**

L T P

4 - -

Class Work	: 50 marks
Exam.	: 80 marks
Practical/Presentation	: 20 marks
Total :	150 marks
Duration of Exam. :	3 Hrs.

The real challenge before the students starts when they corss the threshold of the college after completing their degree. They, all of a sudden, find themselves competing for job/P.G. Degrees, through various entrance tests and interviews. Verbal ability forms a major portion of these tests. Without sound language skills and its semantic-syntatic know-how, the students with engineering background find themselves almost under-prepared for such tests. With this difficulty of students in mind, this course is proposed to make them technically proficient in handling the language skills required in comptitive exams. The course would expose students to almost all veriety of items, the common run of such tests as CAT, GMAT etc. And in the context of LPG, this cutting edge comptence becomes imperative, and no professional education can afford to overlook this aspect.

Course Content :

Unit-I

Remedial English : Parts of speech, Gerunds, Participles and infinitives; Clauses; Sentence-constructions (unity; avoidance of choppy and rambling sentences, logic and consistency, concisness, sequencing of ideas); Sentence errors-agreement between verb and subject, pronoun and antecedents, sequence of tenses, problems involving modifiers (dangling and misplaced modifiers); Shifts in point of view-consistency of number and person, tense, mood, voice and subject; Parallelism; Omissions and mixed constructions.

Unit-II

Vocabulary : Methods of building vocabulary-etmological roots, prefixes and suffixes; Commonly used foreign words and phrases; spelling; words often confused synonyms and homonyms; one word substitutes; verbal idioms.

Unit-III

Punctuation and Machanics : End Punctuation; internal Punctuation; Word Punctuation.

Unit-IV

Comprehension : Abstracting; Summarising; Observation, Findings and Conclusions; Illustration and Inductive Logic; Deduction and Analogy.

Unit-V

Presentation : Oral presentation- Extempore, discussion on topics of contemporary relevance, Interviews.

Sanding :

1. Working with words by R. Gairns and S. Redman, Cambridge University Press, London.

2. Meanings into Words-Upper Intermediate Students Book, Deff/Jones, Foundation Books (Cambridge University Press), Delhi.

3. A Practical English Grammar by A.J. Thomson and A.V. Martinet, OUP, Delhi.

4. Examine your English by Margaret M. Maison, Orient Longman, New Delhi.

5. A Practical Guide to Colloquial Idom by W.J. Ball. Longman.

6. A guide to correct English by L.A. ill, Oxford.

7. Structural Essentials of english by H.whitehall, Longman.

8. Advanced English Practice by B.D. Graver, OUP, Delhi.

9. Public Speaking, Sudha Publication Pvt. Ltd., New Delhi.

10. Group Discussion, Sudha Publication Pvt. Ltd., New Delhi.

Scheme of Examination :

(A) Theoretical :

The pattern of the exam would be more or less like the pattern of the competitive exams. (i.e. Objective Type) like CAT-G-MAT etc. as far as the units I, II, III and IV are concerned.

Unit-I, II, III : (30, 20, 10 Marks respectively)

The first section of the question paper will have 110 objective type questions with no choice at all. These 110 (60 + 40 + 10) questions will converall the first three units. (I, II, III) of the syllabus and would carry 30, 20 and 10 marks respectively. The questions may be in the form of multiple choices, fill in the blank, supply the right word/choice, choose the right alternative, do as directed etc.

Unit-IV 20 marks

The question from this unit will test comprehension competence (in the form of various elements mentioned in the unit) of text given.

(B) Practical (Presentation) :

There will be an oral test carrying 20 marks. The presentation part of the section i.e. Unit-V will be covered in this test. Hence, there is no need to include this unit in theory exam.

Three hours for a group of 15 students are required for this test. Test can be in the form of aqny of the activities mentioned in the Unit-V.

A panel of examiners appointed by the University will evaluated the presentation.

PHY -453 E   LASER TECHNOLOGY

L	T	P
4	-	-

Class Work : 50 marks
Exam : 100 marks
Total   : 150 marks
Duration of Exam: 3 Hrs.

Conditions for Producing Laser, Concept of coherence Special and temporal, Population Inversions, Einstein coefficient Gain and Gain saturation, Saturation intensity, Development and Growth of a Laser Beam, Exponential growth factor, Threshold Requirement for a Laser.

Inversion and two-level systems, steady-state inversions and three and four-level systems. Transient Population Inversions, factors effecting population inversion Laser Amplifiers.

Excitation or Pumping Threshold Requirements Pumping Pathways, Specific excitation Parameters Associated with Optical and Particle Pumping.

Helium-Neon Laser, CO_2 Laser, Ruby Laser, Semiconductor diode Laser.

Recommended Books :

1.   Laser Fundamentals by William T. Silfvast Cambridge University, Press.

2.   Introductory University Optics by John Beynon, (PHI).

3.   Laser-B.B. Laud.

4.   Optics -A.K. Ghatak (TMH).

Note : Eight questions will be set and students will be required to attempt any five questions in all. All questions will carry equal marks.

CSE -303 E   COMPUTER GRAPHICS

L	T	P		
3	-	-	Class Work :	50 marks
			Exam :	100 marks
			Total :	150 marks
			Duration of Exam: 3 Hrs.	

Unit-I: Introduction to Computer Graphics: What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, mid point circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm.

Unit-II: Two/Three Dimensional Viewing: The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck).

Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation.

Three dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

Unit-III: Viewing in 3D: Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.

Unit-IV: Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm.

Unit-V: Representing Curves and Surfaces : Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method.

Unit-VI: Illuminations, **shading, image manipulation**: Illumination models, shading models for polygone, shadows, transparency. What is an image? Filtering, image missing, geometric transformation of images.

Unit-VII :
- Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addision Wesley.
- Computer Graphics by Donald Hearn and M.Pauline Baker, 2nd Edition, 1999, PHI

Reference Books:
- Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition
- Fundamentals of 3 Dimensional Computer Graphics by Alan Watt, 1999, Addision Wesley.
- Computer Graphics: Secrets and Solutions by Corrign Joh, BPB
- Graphics, GUI, Games & Multimedia Projects in C by Pilania & Mahendra, Standard Publ.
- Computer Graphics Secrets and solutions by Corrign Joh, 1994, BPV
- Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

HUM-455-E **ENTREPRENEURSHIP**

L T P
3 1 -

Class Work : 50 Marks
Theory : 100 Marks
Total : 150 Marks
Duration of Exam. : 3 Hours

Unit-I

Promotion of Entrepreneurship

Meaning, definition and functions of an entrepreneur, qualities of a good entrepreneur; Role of Entrepreneur in economic development; Government measures for the promotion of small scale industries with special reference to Haryana; Cultural factors in developing entrepreneurship.

Unit-II

Ownership and Location of Industrial Units

Different forms of Industrial Organisation.

Theories of Industrial location. Process of preparing project reports.

Unit-III

Size of Firm and Pricing

Concept of optimum firm, factors determining.

Optimum size. Technical, Managerial, Marketing Uncertainties and risk. Pricing Methods, Policies and procedures.

Unit-IV

Financing of Small Industries

Importance and need : Commercial Banks and term lending in India; Banks and under-writing of capital issues; Brief description about the role of other financial agencies viz; Industrial Finance corporation of India. State Financial Corporation, Industrial Development Bank of india; Unit Trust of India.

Unit-V

Problems Faced by small Enterprises

Problems connected with marketing, Management of New products; Power; Finance; Raw Material; Under-utilization of capacity; Causes of under-utilization; Rehabilitation of Sick Mills.

Unit-VI

Government and Business

(a) Highlights of Industrial Policy and Licensing Policy.

(b) International Marketing with special reference to export documentation.

Recommended Books :

1. Entrepreneurship of Small Scale Industries-Deshpande Manohar D. (Asian publishers, New Delhi).

2. Environment and Entrepreneur-Tandon B.C. (Asian Publishers, New Delhi).

3. The Industrial Economy of India-Kuchhal S.C. (Chaitanya, Allahabad).

4. Emerging Trends in entrepreneurship Development Theories & Practices-Singh P. Narendra (International)

5. Entrepreneur, Banker & Small Scale industries-Bhattacharya Hrisnikes.

6. Entrepreneurship & Growth of Enterprise in Industrial Estates-Rao Gangadhara.

Note : Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

HUM-457-E   BUSINESS COMMUNICATION

L   T   P
4   -   -

Class Work : 50 Marks
Theory   : 100 Marks
Total   : 150 Marks
Duration of Exam. : 3 Hours

The course proposes to help students develop business and technical communication competence. It focuses on writing skills and strategies for specific purposes. The inevitability of introducing this course to Engineering students is embodied in that it has comparatively a high concentration of certain complex writing techniques and procedures.

Course Content :

Unit-I

Business Correspondence : Characteristics and formats of Business letter; Quotations, Orders, Tenders, Sales letters, claim and adjustment letters, Credit and Collection letters, Application Letters for vacant situations with emphasis on Resumes and Curriculum Vitae; E-mail and Netiquette-format, style and tone.

Unit-II

Business Reports and Proposals : Importance, Function, Pattern and formats of Reports, Typical Business Reports, Report Organisation and Presentation, and Formal Reports; Proposal Formats, Writing problem-Solving proposals, Executive Summary Proposals and project Proposals.

Unit-III

Meetings : Writing of Memorandum, Notes, Agenda and Minutes of Meeting.

Unit-IV

Public Relations and Advertising Documents : Press Releases, Public Service announcements, Advertising Strategy and its objective, Designing of Classified and Display Advertising copies.

Suggested Reading :

1. *Business Communication : Process & Product* by Hary Ellen Guffey, IV Edition, South-Western College Publishing, Cincinnati.

2. *Business Correspondence and Report Writing* by R.C. Sharma & Krishna Mohan, Tata Macgraw Hill Publication, New Delhi.

3. *Effective Business English and Correspondence* by M.S. Ramesh and C.C. Pattanshetti, R. Chand & Co., New Delhi.

4. *Effective Letters in Business* by Robert by C. Shruter, Tata Macgraw Hill, New Delhi.

5. *English Business Letters* by F.W. Wing & D. Anncree, Orient Longman.

6. *Written Communication in English* by Sarah Freeman, Orient Longman.

7. *International Business English* by Leo Jones & Richard Alexander, Cambridge University Press.

8. *General and Business English* by Sweet Stephen, Sir Issac Pitman & Sons Ltd., London.

9. How to Write and Present Technical Information, Charles H. Sides, Cambridge University Press, U.K.

10. Strategies for Engineering Communication, Susan Stevenson/ Steve Whitmore, John Wiley and Sons, Inc. Printed in India by Replika Press. Pvt. Ltd., Delhi.

Scheme of Examination

There will be six questions in all, covering all the units. All questions will be compulsory and will have enough internal choice.

Unit-I   **30 Marks**

There will be two questions from this unit. One question will cover the theoretical aspect of business letter writing and will carry 10 marks. The other question will be on writing the letter in a proper format on a subject given and will be of 20 marks. There will be enough choice taking care of the justice to be given to both the aspects of the letter writing.

Unit-II   35 Marks

There will be two questions from this unit. One question will cover the theoretical aspect of report/proposal writing and will carry 15 marks. The other question will be on preparing the report/proposal on a topic/subject given and will be of 20 marks. There will be enough choice taking care of the justice to be given to both the aspects of the report writing.

Unit-III   15 Marks

There will be a question on theoretical aspects of the various items of this unit or students can be asked to draft a specimen of any of these from the material given in the exam. The question can be split into parts.

Unit-IV   20 Marks

There will be one question having two parts. One part will be on theory and will be of 5 marks and the other will require the drafting an advertisement copy of a product or service or a public announcement and will carry 15 marks.

IC-403-E   EMBEDDED SYSTEMS DESIGN

L   T   P   Class Work : 50 Marks
3   1   -   Theory   : 100 Marks
                                                   Total   : 150 Marks
                                                   Duration of Exam. : 3 Hours

Unit-1

Introduction

Different of microcontrollers : Embedded microcontrollers, External memory microcontrollers; processor Architectures: Harvard V/S Pronceton, CISE V/S RISC; microcontrollers memory types, microcontrollers features : clocking, i/o pins, interrupts, timers, peripherals.

Unit-2

Microcontroller Architecture

Introduction to PIC microcontrollers, Architecture and pipelining, program memory considerations, Addressing modes, CPU registers, Instruction set, simple operations.

Unit-3

Interrupts and I/O Ports

Interrupt logic, Timer 2 scalar intialization, Int Service Interrupt service routine, loop time subroutine, External interrupts and timers, Synchronous serial port module, Serial pheriphal device, O/p port Expansion, I/p port expansion, UART.

Unit-4

Software

Development tools/environments, Assembly language programming style, Interpreters, High level languages, Intel hex format object files, Debugging.

Unit-5

Programming with Microcontrollers

Arithmetic operations, Bit addressing, Loop control,Stack operation. Subroutines, RAM direct addressing, state machines, Oscillators, Timer Interrupts, Memory mapped I/O.

Unit-6

Designing using microcontrollers

Music box, Mouse wheel turning, PWN motor control, Aircraft Demonstration, ultra sonic distance measuring, Temperature Sensor, Pressure Sensor, Magnetic Field Sensor.

Text Book

1. Design with PIC Microcontrollers by John B. Peatman, Pearson.

Reference Books

1. Programming and Customizing the 8051 Microcontroller : Predko : TMH.

2. Designing Embedded Hardware : John Catsoulis; Shroff Pub. & Distr. ND.

3. Programming Embedded Systems in C and C++ : Michael Barr; Shroff Pub & Distr ND.

AL AND EXPERT SYSTEMS

CSE-451-E

L	T	P		
3	1	-	Class Work	: 50 Marks
			Theory	: 100 Marks
			Total	: 150 Marks
			Duration of Exam.	: 3 Hours

Contents

1. **Introduction to Artificial intelligence :** Scope, history & applications. AI as representation and search the predicate calculus inference rules. Logic based financial advisor, structures and strategies for state space search graph theory, strategies for spearch, using state space to represent reasoning with the predicate calculus.

2. **Heuristic Search :** An algorithm for heuristic search, admissibility monotonicity and informed ness heuristics in games, complexity issues, control and implementation of state space search recursion based search, pattem directed search, Production systems, predicate calculus and planning the black board architecture for problems solving.

3. **LISP and PROLOG :** Knowledge representation languages issues in knowledge representation, network representation language, structured representation, introduction to LISP, search in LISP : a functional approach to the farmer, Wolf, Goat and cabbage problem, higher order functions & procedural abstraction, search strategies in LIPS.

4. **Expert systems :** Introduction, History basic concepts, structure of expert systems, the human element in ES how ES works, problem areas addressed by ES, ES success factors, types of expert systems, ES and the internet interacts web, knowledge engineering, scope of knowledge, difficulties, in knowledge acquisition methods of knowledge acquisition, machine learning, intelligent agents, selecting an appropriate

knowledge acquisition method, knowledge acquisition form multiple experts validation and verification of the knowledge base, analyzing coding, documenting & diagramming.

5. Expert systems-II, societal impacts reasoning in artificial intelligence, inference with rules, with frames: model based reasoning, case based rezoning, explanation & meta knowledge inference with uncertainty representing uncertainty probabilities and related approaches, theory of certainty (certainty factors) Qualitative reasoning, the development life cycle, phases, I,II,III,IV,V,VI the future of expert system development process societal impacts.

Text Books

1. Efrain Turban and Jay E. Aranson : Decision support systems & intelligent systems (5th Edn.) Prentice Hall, 1998.

2. Donald A Waterman : A Guide to expert Systems, Addison-Wesley 1995.

3. G.F. Luger & W.A. Stubble Field-Artifical Intelligence Structures and Strategies for complex problem solving, 3rd Edn. Addision Wesley, 1998.

4. E. Rich and Knight, Artificial Intelligence, Second Edn, Tata Mc. Graw Hill Publishing, 1981.

IT-471-E   MANAGEMENT INFORMATION SYSTEM

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L   T   P                        Class Work : 50 Marks
4   -   -                        Exam       : 100 Marks
                                 Total      : 150 Marks
                                 Duration of Exam. : 3 Hours
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Unit-1

Foundation of Information System : Introduction to Infromation System and MIS, Decision support and decision making systems, systems approach, the systems view of business, MIS organization within company, Management information and the systems approach.

Unit-2

Information Technology : A manager's overview, managerial overviews, computer hardware & software, DBMS, RDBMS and Telecommunication.

Unit-3

Conceptual system design : Define the problems, set systems objects, establish system constraints, determine information needs determine information sources, develop alternative conceptual design and select one document the system concept, prepare the conceptual design report.

Unit-4

Detailed system design : Inform and involve the organization, aim of detailed design, project management of MIS detailed design, identify dominant and trade of criteria, define the sub systems, sketch the detailed operating sub systems and information flow, determine the degree of automation of each operation, inform and involve the organization again, inputs outputs and processing, early system testing, software, hardware and tools propose an organization to operate the system, document the detailed design revisit the manager user.

Unit-5

Implementation evaluation and maintenance of the MIS : Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files test the system cut-over, document the system, evaluate the MIS control and maintain the system. Pitfalls in MIS development.

Unit-6

Advanced Concepts in Information Systems : Enterprise Resources Management (ERP), Supply Chain Management, CRM, Procurement Management System.

Text Books :

• Management Information System by W.S. Jawadekar, 2002, Tata McGraw Hill.

• Information System for Modern Management (3rd edition)-Robert G. Murdick, Loel E. Ross & James R. Claggett. PHI.

Reference Books

• Management Information System; O Brian; TMH

• Management Information System by Davis Olson Mac Graw Hill.

• Management Information System by Stasllings, (Maxwell Mc Millman Publishers).

• Information System; a Management Perspective; Alter Addison Wesley.

• Introduction to Information System; McGraw Hill.

Note : Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

PHY-451-E   NANO TECHNOLOGY

L T P	Theory : 100 Marks
4 - -	Class Work : 50 Marks
	Total : 150 Marks
	Duration of Exam. : 3 Hours

Unit-1

Introduction to Nanotech

Crystalline-Non crystalline materials, Fundamental of Nanotechnology and Nanomaterials in Metals, other Materials, & Biosystem, Molecular Recognition, Quantum Mechanics and Quantum Ideas in Nanotechnology. Semiconductor Nanoparticles.

Unit-2

Preparation and Characterization of Nanoparticles

Nanoscale Lithography, Dip Pen Lithography, E-Beam Lithography, Nanosphere Life off, Lithography; Molecular Synthesis, Nanoscale Crystal Growth, Polymerization Nanobricks and Building blocks :

Tools for Measuring Nanostructures-Scanning Probe Instrument, Spectroscopy, Electrochemistry, Election Microscope Tools to Make Nanostructure.

Unit-3

Properties & Application of Nano Crystalline Materials

Application in Sensors, Nanoscale Biostructure Electronics, Magnets, optics, Fabrication Biomedical Applications, Smart Materials-Self Healing Structures, Heterogenous Nanostructure and composites En capsulation, Carbon Nanotubes.

Unit-4

Synthesis of semiconductor Nanoclusters, Processing of Nanomaterials Nanobusiness-Boom, Bust and Nano Tech. NanoEthics

References

1. Camarata, R.C. Nanomaterials synthesis, properties and application Institute of Physics Publication.
2. Madou, Fundamentals of microfabrication, Mcgraw Hill.
3. Sibelia, J.P., A Guide to Material characterization, Prentice Hall.
4. Mark Ratner, Daniel Ratner-Nano Technology-A Gentle Introduction to the next big idea.

Note: The question paper will contain 8 questions in all. The student will be required to answer any five. At the most one question will be set from each section.

IT-204 - E   MULTIMEDIA TECHNOLOGIES

L	T	P	
4	-	-	

Class Work : 50 Marks
Exam   :   100 Marks
Total   :   150 Marks
Duration of Exam: 3 Hrs.

Unit-1: Basics of Multimedia Technology: Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD-Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools; LANs and multimedia; internet, World Wide Web & multimedia distribution network-ATM & ADSL; multimedia serves & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.

Unit-2: Image Compression & Standards: Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; IPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.

Unit-3: Audio & Video: Digital representation of sound; time domain sampled representation; method of encoding the analog signals; subband coding; fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadraphonic signal processing; edition sampled sound; MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical

instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.

Unit-4: Virtual Reality: Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems. Applications of environment in various fields.

Text Books:
- An introduction, Villamil & Molina, Multimedia Mc Milan, 1997
- Multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

Reference Books:
- Multimedia: Production, planning and delivery, Villamil & Molina,Que, 1997
- Multimedia on the PC, Sinclair,BPB
- Multimedia: Making it work, Tay Vaughan, fifth edition, 1994, TMH.
- Multimedia in Action by James E Shuman, 1997, Wadsworth Publ.,
- Multimedia in Practice by Jeff coate Judith, 1995,PHI.
- Multimedia Systems by Koegel, AWL
- Multimedia Making it Work by Vaughar, etl.
- Multimedia Systems by John .F. Koegel, 2001, Buford.
- Multimedia Communications by Halsall & Fred, 2001,AW.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IC-455-E   INTELLIGENT INSTRUMENTATION FOR ENGINEERS

L T P

4 - -

Exam.	:100 Marks
Sessional	: 50 Marks
Total	: 150 Marks
Duration of exam. : 3hrs	

1. **Introduction** : Intelligence, features characterizing intelligence, intelligent instrumentation system; features of intelligent instrumentation; components of intelligent instrumentation system; Block diagram of an intelligent instrumentation system.

2. **Signal Processing, Manipulation and Transmission :** Signal amplification & attenuation (OP- AMP based); Instrumentation Amplifier (circuit diagram, high CMRR& other features); Signal Linearization (different types such as Diode-resistor combination, OP-AMP based, etc.); Bias Removal , Signal filtering (outputs from ideal filters, outputs from constant-k filters, matching of filter sections, active analog filters); OP-AMP based Voltage-to-current converter, Current-to-voltage conversion, Signal integration, Voltage follower (pre-amplifier), voltage comparator, Phase-locked loop, Signal addition, Signal multiplication, Signal Transmission (Signal amplification, Shielding, Current loop transmission, Voltage-to-frequency conversion, Fiber optic transmission); Description of Spike (software-based).

3. **Smart Sensors** : Primary sensors; Excitation; Compensation (Nonlinearty: look up table method, polygon interpolation, polynomial interpolation, cubic spline interpolation, Approximation & regression; Noise & interference; Response time; Drift; Cross-sensitivity); Information Coding/Processing; Data Communication; Standards for smart sensor interface.

4. **Interfacing Instruments & Computers** : Basic issues of interfacing; Address decoding; Data transfer control; A/D converter; D/A converter; Sample & hold circuit; Other interface considerations.

5. **Recent Trends in Sensor Technologies :** Introduction; Film sensors (Thick film sensors, Thin film sensors); Semiconductor IC technology-standard methods; Microelectro-mechanical systems (Micro-machining, some application examples); Nano-sensors.

Text Book :

1. Barney, G.C., Intelligent Instruments. Hemel Hempstead: Prentice Hall, 1985.

2. Alan S. Morris, Principles of Measurement & Instrumentation, N. Delhi: PHI Pvt. Ltd., 1999.

Reference Book :

1. D. Patranabis, Sensors & Transducers, N. Delhi: PHI, 2003.

2. Roman Kuc, Introduction to Digital Signal Processing. N. York: Mc Graw-Hill Pub. Co.

Note : 1. In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.

2. Use of scientific calculator will be allowed in the Exam. However, pager, programmable calculator & cellular phone etc. will not be allowed.

HUM-453-E   HUMAN RESOURCE MANAGEMENT

L T P		Class Work	: 50 Marks
4 - -		Exam	: 100 Marks
		Total	: 150 Marks
		Duration of Exam.	: 3 Hours

Unit-I
Understanding Organisational Behaviour : Definition, Goals of Organisational behaviour. Key forces affecting Organisational Behaviour. Fundamental Concepts of Organisational Behaviour.

Unit-II
Motivation : Meaning, Objectives and importance of motivation. Theories of Motivation, Maslow's theory, Mc Greger's Theory Herzberg's theory.

Morale : Meaning; Factors affecting morale, types of morale morale and productivity, Evaluation of morale, improving morale.

Unit-III
Communication : Definition & importance, Nature of leadership various approaches to leadership styles.

Unit-IV
Leadership : Definition & importance, Nature of leadership various approaches to leadership styles.

Unit-V
Importance of human resources in industry, Definition of human resource management, mechanical approach towards personnel, Paternalism, Social system approach.

Unit-VI
Need for human resource planning, process of human resource planning, Methods of recruitment, Psychological tests and interviewing meaning and importance of placement Meaning and techniques of induction. Training and development : Concepts of training and development, importance of training and development, Management development its nature, purpose and method.

Unit-VII

Significant factors affecting compensation, Methods of wage payment, Wage differentials, Causes of difference in Wages, Types of wage differentials, Wage incentives, Meaning, Objectives, types of incentive plans.

Recommended Books :

Text Books :

1. Human Resource and Personnel Management-K. Aswathappa-Tata McGraw Hill Publishing Company Ltd.
2. Personnel Management : C.B. Mamoria, Himalaya Publishing House.
3. Organisational Behaviour-Dr. L.M. Prasad (Sultan Chand & Sons).

Reference Books :

1. Personnel Management & Industrial Relations : Dr. T.N.Bhagoliwal Sahitya Bhawan Agra.
2. Personnel Management : V.G. Karnik, Jaico Publishing House.
3. Personnel management & Industrial Relation : Tripathi : Sultan Chand & Sons.
4. Personnel Management-Arun Monappa & Mirza Saiyadain-Tata McGraw Hill Publishing Co. Ltd.
5. Personnel Management and Industrial Relations-D.C. Sharma & R.C. Sharma S.J. Publications.
6. Principles of Personnel Management-Edwin B. Flippo (McGraw Hill).
7. Organizational Behaviour-K. Adwathappa.
8. Organizational Behaviour-John W. Newsstorn & Keith Davis, Tata McGraw Hill Publishing Company Limited, New Delhi.

Note : Eight questions are to be set at least one question from each unit and the students will have to attempt five questions in all.

CH-453-E   POLLUTION AND CONTROL

L   T   P   Class work : 50 Marks
4   -   -   Exam   : 100 Marks
                                   Total   : 150 Marks
                                   Duration of Exam. : 3 Hours

I. **Waster Water & its treatment Processes :** Waster-water characteristics, effiluent standards, primary treatment, secondary treatment-aerobic (activated sludge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB).

II. **Air Pollution :**

Classification of air Pollutants Particulates : Physical characteristics, mode of formation, setting properties, Control measures.Hydrocarbons : Nature; sources, control Carbon Monoxide : Source, harmful effects on human health, control measure.

Oxides of Sulphur and Nitrogen Sources, effects on human health and plants. Control measure.

III. **Solid Waste :** Types, sources and properties of solid waste, solid waste management-Generation, Collection and techniques for ultimate disposal, Elementary discussion on resource and energy recovery.

IV. Elementary treatment of nuclear pollution, metal pollution, noise pollution their effects & control.

Books Suggested

1. Environmental Engg. : by Howard S. Peavy & Others, MGH International.
2. Metacaf-EDDY-Waste-water engineering revised by George Teholonobus (TMH).
3. Environmental Chemistry by B.K. Sharma, Goel Publishing, Meerut.
4. Environmental Chemistry, A.K. DE, Wiley Eastern.
5. Air Pollution : H.C. Perking-McGraw Hill.

Note : Eight questions will be set and students will be required to attempt five questions in all.

ME-451-E   **MECHATRONIC SYSTEMS**

L   T   P   Class Work : 50 Marks
4   -   -   Exam   : 100 Marks
                     Total   : 150 Marks
                     Duration of Exam. : 3 Hours

Unit-1

Introduction to Mechatronics. Integrated design issues in Mechatronics, Conceptual design. Possible design solutions. Integrated approach for combining sensors, actuators, computer and the product. Some examples-like auto focus camers, engine combustion control, washing machine, vehicle suspensions, electro-mechanical brakes, manufacturing machine, industrial robots, air conditioning systems, etc.

Unit-2

Classification of sensors of various type, resistive, strain gage, themistor, inductive, capatitive, piezoelectric, optical, photodetectors, encoders, ultrasonic types silicon sensors, Micro-sensors for various measurements. Consideration for choice of sensors for a given application.

Signal conditioning and data acquisition using computers. AD and DA converters. Use of plus-in-cards and software for acquiring and from several sensors.

Unit-3

Mechanical actuation systems-kinematic chains,cams, gear trains, beld and chains drive, ratchet and prawl, bearing, guideways, ball screw and nut, etc. Electrical actuation systems : Operational characteristic and application of electrical actuation components for application like, AC/DC motors, stepper motors, relays, push buttons, switches, solenoids etc.

Unit-4

Introduction to semiconductor electronics, junction diode, bipolar junction transistor, field effect transistors, digital logic. Number systems. Logic gates Boolean algebra. Application of logic gates. Combinational and sequential logic.

Unit-5

Sequence control, relay ladder diagrams for sequence control in processes and machines. Programmable Logic Controllers and applications : PLC structures, PLC languages, programming of PLC using Mnemonics, Interfacing PLC with actuators, Sequencing of cylinders. Timers, internal relays and counters. Open loop and closed loop control using PLC.

Unit-6

Architecture of microprocessors and microcontrollers. Use of suitable software languages for micro controllers and their applications in meachatronic systems. Real time interfacing between computers and measurement or control systems. Introduction to modeling and computer control of process and mechanical systems.

Unit-7

Communication systems Protocols, Open systems interconnection models. Smart transducers and transmitters. Field buses.

Text Books

1. Mechatronics-Electronic control in mechanical & electrical engineering by W.Bolton, Longman Indian Edn. 1999.

2. Mechatronic system design, by D. Shetty and R.A. Kolk-Mechatronic system design, PWS Publ. Co., Boston, 1997.

3. Mechatronics and Measurement Systems by D.G. Alciatore and M.B. Histand, TMH Publ. 2nd Edn. 2003.

Note : In the semester examination, the examiner will set 8 questions in all, and students will be required to attempt only 5 questions.