6th Semester

MANAGEMENT INFORMATION SYSTEM

Section A

Introduction to MIS: Meaning and role of MIS. Definition of MIS, System approach to MIS, MIS organization within a company.

MIS Planning: General business planning derivation of MIS plan, Prioratisation and development strategies.

Section B

Conceptual Design of MIS: Definition of the problem, System objective and system constraints, Analysis of information source, Conceptual system design document.

Section C

Detail System Design and Implementation: Application of basis system design concept to MIS, Involvement of end-user and role of MIS department and system Analyst Role of top management during design and implementation. System evaluation, review and update.

Section D

Discussion of the following MIS in a standard layout given in the note below.

1. MIS for personal system (See note at end)
2. MIS for Accounting and Finance Function (See note at end)
3. MIS for marketing system (See note at end)

Note: -

Key information needs
Transaction processing and management control
Reports design and data collection methods: routing frequency etc
Input
Output

Books

1. Management Information System, S Sadgopan, Prentice Hall of India
2. Introduction to computer Information System for Business, Mark G. Simkin, S. Chand & Co. 1996.
3. Management Information System James A. O'Brien, Galgotia Publication 1994.
4. John Dearden & F Warrah MC Farlan " MANAGEMENT INFORMATION SYSTEM TEXT AND CASES"

6th Semester

WEB TECHNOLOGY

Section –A

Internet: Its Architecture / Structure, Current development modes of connecting to internet, ISP, Internet addressing DNS, Hypermedia approach to seamless integration of information distribution like FTP, telnet etc, MM

Privacy & Security Topics: Digital signature, Firewalls, Encryption scheme etc.

Section B

Introduction to Web: Structure of Web pages, Basic principle of web page design and implementation guidelines, focus on communication, case of navigation within pages, Listing of site in database + directories searching method and adopted by search engine.

Server: Introduction web servers: PWS, IIS Apache Accessing & using these servers.

Section C

Techniques & Tools for Web Page Design:

HTML /DHTML, Dream weaver, Flash, Macromedia directors.

Java scripts: java scripts language, client and server and programming, Form and data in java script.

Section D

Web database & database Access issue: Middleware & current middleware, transaction processing issues capacity planning, Data transfer ratio, Recovery procedure, Reliable.

Books:

1. John R Hubbard, Programming with Java, Schaum's Outline Series, McGraw Hill International edition 1999.
2. Joseph L.Weber," Using Java 2 platform " prentice Hall of India Pvt Ltd, 2000.

6th Semester

NUMERICAL & STAT METHODS AND SCIENTIFIC COMPUTING

Section A

Computer Arithmetic and Errors: Representation of integers and real numbers in computers. Fixed point arithmetic, Floating point arithmetic, Normalized floating point numbers, Error due to storage imitations and safeguards, Round off and truncation errors, Relative and absolute errors.

Solution of Non-linear equations: Bisection method for solution of a single non-linear equation, rate of convergence of the solution. Newton-Raphson method for solution of a single non-linear equation. Radius of convergence. Generalization to several non-linear equations.

Section B

Interpolation and extrapolation: The Lagrange interpolating polynomial, The Gregory-Newton interpolating polynomial. The difference table and error propagation in calculating the differences. Approximating differentials using finite differences. Uniqueness of the interpolating polynomial.

Numerical differentiation and integration: Numerical differentiation: Method based on finite differences. The trapezoidal rule with error estimate. The Simpson's rule with error estimate. The Gaussian quadrature methods with error estimates.

Section C

Solution of ordinary differential equations: Taylor series method. Euler's method with estimate of error and error propagation. Runge-kutta methods with error estimate and error control using step adjustment. Predicator-corrector methods with error estimate.

Solution of system of linear equation: Gaussian elimination with pivoting. Iterative improvement of solution vector. Gauss Jordan method for finding the inverse of a matrix. Gauss Siedel method together with convergence criterion.

Section D

Matrix Diagonalisatin: Unitary transformations. Jacobi's method for diagonalization of real symmetric matrices.

Statistical methods: Curve fitting using least-square method. Determining the goodness of fit Using chi-square test. Generation of pseudo-random numbers. Introduction to Monte-Carlo method for numerical integration. Introduction to genetic algorithm for optimization.

Books:

1. M. K. Jain, S. R. K. Jain, "Numerical Methods for scientific and Engineering Computation (1993), New Age Int. (P) Ltd., New Delhi.
2. I. R. Miller, J. E. Freund and R. Johnson, "Probability and statistics for Engineers"(1990), Prentice Hall of India, New Delhi.
3. S. D. Conte and C. De Boor, "Elementary Numerical Analysis" (1980), McGraw Hill Publications.
4. E. Kreyszig, "Advanced Engineering Mathematics", Wiley Eastern Ltd. (7th edition), New Delhi.
5. P. L. Meyer, "Introductory Probability Statistical Application", Oxford and IBH Pvt. Ltd. (2nd edition), New Delhi.

ARTIFICIAL INTELLIGENCE

Section –A

Scope of AI: Games, theorem Proving, Natural Language Processing, Vision and speech processing, Robotics, Expert system AI techniques search knowledge, abstraction, problem solving, State space search, Control strategies, depth first search, breadth first search, production system, problem characteristics, Decomposable, ignorable, recoverable, predictable.

Knowledge Representation: Predicate logic, well-formed formulas, quantifiers, prenex normal form skolemization, unification, modus pones, resolution refutation various strategies

Rule based system, Forward reasoning: Conflict resolution Backward reasoning: Use for no back track. Structured knowledge representation.

Section B

A.I. programming language

PROLOG: Syntax, procedural and declarative meaning, Prolog unification mechanism, Anonymous variable, Lists, Use of fail, CUT, not.

LISP: Basic concepts, Eval function, Function and variable, scooping of LISP variable, iteration and recursion.

Section C

Headlong uncertainty: Probabilistic reasoning, Byes net, Dumpster Shafer theory: use of certainty factors Fuzzy logic, no monotonic reasoning, Dependencdirectedbackt, Truth maintenance systems.

Learning: Concept of learning, learning automation, the genetic algorithm, learning by induction, Neural Networks: Hop field Networks, perceptions learning algorithm, back propagation network, Boltzman Machine.

Section D

Planning: Components of planning system, Plan generation algorithm: Forward state propagation, backward state propagation, non-linear planning using constraint posting.

Expert System: Need & justification for expert system – Cognitive problems, Expert system architecture: Rule based system, Non-production system, knowledge acquisition, case studies: MYCIN, RI.

Natural language processing: syntactic analysis, top down and bottom up parsing, Augmented transition networks Semantic analysis case grammars.

Books: -

1. AI – E. Rich & K Knight Tata McGraw Hill (2nd edition)
2. Introduction to Expert system – D.W. Paterson, Prentice Hall of India (1992)
3. Introduction to expert system –Peter Jackson, Addison Wesley publishing company.
4. AI an engineering Approan –R.J Schalkoff, McGraw Hill international Edition
5. Principles of AI Nilsson Narosa publishing Narosa publishing house.
6. Programming in PROLOG – Clocksm 7 Mellish, Narosa Publishing House
7. Rule Based Expert System- M. Sasikumar, S, Ramani
8. Artificial Intelligence – P.H. Wisnston, 2nd edition, Addison Wesley 1884.

6th Semester

MULTIMEDIA TECHNOLOGY

Section A

Introduction: Motivation, Module Overview, Evolution of Multimedia, Structure and components of Multimedia. Application Domains, Internet and Multimedia, Multimedia and Interactivity, Primary User-Interface Hardware: Mouse. Keyboard, Joystick. Primary Visual Interface Items: Window, Buttons, Textbox, Icons. Basic Metaphors: Side – Show, Book, Hypertext, Hypermedia, Browsers and helper Application overview, User Interface Design Issues.

Technology: Sound and Audio, Psycho accoustics – Frequency and amplitude sensitivity of hearing music and noise, stereo effects. Masking, Frequency domain compression of analog sound signal, digitization of audio signal - sampling and coding, digital audio signal processing, architecture of a sound card, elementary concept of music, pitch and voice, staff notation and scoring, electronic music and synthesizer, MIDI interface, protocol and data format.

Section B

Image & Graphics: Principles of raster graphics, Computer Visual Display concepts, Resolution, colour and pallets, Refresh rates an graphic accelerators, Digital image Representation and formats, Graphic drafting Tools, Image processing and enhancement, Colour printer principles, Image scanner principle, File formats, Digital still Camera and photography.

Video Technology: Analog Video, Principles Broadcast standards, CCD Camera, Recording formats and standard, Digital Video, Principles, PC video and Videoconference standards, TV Cards Frame Grabber Principles, IDTV and HDTV principles, Motion Picture to Video Conversion.

Data Compression: Data Compression Requirement, Information Theory based and frequency domain based and compression, Basic Compression Techniques: DPCM, Runlength Coding, Huffman Coding, JPEG/ISO, Real-time encoding and CCITT H.261 (px64) standard, MPEG-I land II, DVI.

Section D

Synchronization: Temporal Dependence in Multimedia presentation. Inter-object and Intra-object Synchronisation, Time Abstruction for authoring and visualization, Reference Modle and Specification.

Application Development: Product development overview, Life cycle Models, Human Roles and Teamwork, Product Planning, Basic Authoring Paradigms: Story Scripts, Authoring Metaphors and authoring languages, Content Analysis: Message, platform, Metaphor and Navigation, cost-quality tradeoffs, Intellectual Property Right and Copyright issues.

Books:

1. Multimedia Systems Design, P.K.Andleigh and K.Thakrar, Prentice hall PTR, 1996.
2. Multimedia Computing, Communications and Applications, Ralf Steinmetz and Klara Nashtedt, Prentice Hall 1995.
3. Creating Multimedia Presentations, Douglas E.Wolfgram, Que. Crop., 1994.
4. Multimedia Authoring: Building and Developing Documents, Scott Fisher, AP Professional, 1994.

6th Semester

PARALLEL COMPUTING

Section A

Review of Computer Architecture: Taxonomy of MIMD Computers, Multi-vector and SIMD, Computers, Vector Supercomputers SIMD Supercomputers.
PRAM and VLSI Models: Parallel Random Access Machines, VLSI Complexity Model.
Architectural Development Tracks: Multiple-Processor Tracks, Multi-vector and SIMD Tracks, Multithreaded and Dataflow Tracks.
Conditions and Parallelism: Data and Resource Dependences, Hardware and Software Parallelism, The role of compilers.
Program partitioning and scheduling: grain Sizes and Latency, Grain Packing and scheduling, static Multiprocessor Scheduling.
Program Flow Mechanisms: control flow Mechanism, Demand-Driven Mechanism, Comparison of Flow Mechanisms, System Interconnect Architectures: Network properties and Routing, Static Connection networks, Dynamic Connection Networks.

Section B

Performance Metrics and Measures: Parallelism Profile in Programs, Harmonic mean Performance, Efficiency, Utilization and Quality, Standard Performance Measures.
Speedup performance Law: Amdahl's law for a fixed workload, Gustafron's Law for sealed problems.
Scalability Analysis and Approaches: Scalability metrics and Goals, Evolution of Scalable Computers.
Advance Processor Technology: Instruction set architecture, CISC and RISC Scalar processors.
Superscalar and Vector Processors: Superscalar Processors, The VLIW Architecture, Vector and Symbolic Processors.

Section C

Multiprocessor System Interconnects: Hierarchical Bus system, Crossbar Switch and Multiport Memory, Multistage and Combining Networks.
Cache Coherence and Synchronization Mechanism: The Cache coherence problem, Snoopy bus protocol, Hardware Synchronization Mechanisms.
Vector Processing principles: Vector Instruction Types, Vector Access Memory Schemes.
Multivector Multiprocessors: Performance Directed Design rules, Cray Y – MP, C-90 and NTP
SIMD Computer Organization: Implementation Models, The CM-2 Architecture.

Section D

Software for parallel Programming: Shared variable Model, Message Passing Model, Data parallel Model, Function and Logic Models.
Parallel Programming Environment: Software tools and environment, Y-MP, Pargon and CM-5 Environment, Visualization and Performance Testing.
Synchronization and Multiprocessing Modes: Principles of synchronization, Multiprocessor execution Models, Shared-Variable Program Structures, Locks for protected access, Semaphores and Applications, Monitors and Application, Message-passing program Development, Distributing the Computation, Synchronous Message passing, Asynchronous message passing.

Books: -

1. Kai Hawang: Advance Computer Architecture – Parallelism, Scalability and Programmability, McGraw Hill International Edition, Computer Series 1993.
2. Michael J. Quinn: Parallel Computing – Theory and Practice, McGraw Hill International Edition, Computer Science Series, 2nd Edition, 1994.
3. S. G. Akl: Design and Analysis of parallel algorithms, Prentice Hall, Englewood Cliff NJ.

6th Semester

ARTIFICIAL INTELLIGENCE LAB

Instructions for paper setter / Candidates

Laboratory examination will consist of three parts:

1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

List of Practical: -

1. Implement these practical in LISP or Prolog in which you feel comfortable.
    a) Depth –bounded depth first search.
    b) Iterative Deepening Search.
    c) Best first search.
    d) A * Search.
    e) AO* Search.
    f) Minmax Search.
    g) Alpha Beta Pruning.
2. Solve the water jug problem using AI technique.
3. Solve the Missionaries problem using AI technique.
4. Design the following expert system using LISP or Prolog in which you feel comfortable.
    a) Weather Forecasting System.
    b) Legal Expert System.

6th Semester

WEB TECHNOLOGY LAB

Instructions for paper setter / Candidates

Laboratory examination will consist of three parts:

1. Performing a practical examination assigned by the examiner. (25 marks)
2. Viva-voce examination. (25 marks)

Viva-voce examination will be related to the practical performed/projects executed by the candidate related to the paper during the course of the semester.

To create dynamic animation, simulations and interactive web pages using HTML, Java Script.

Create databases using: -

A.HTML / Java Script / DHTML

WEB Technology

1. Setting up intranet.
2. Learning of tools – DHTML, flash, director
3. Design of web pages/sites.
4. Development of web pages/site.
5. Evaluation of web site.
6. Registering of website.

6th Semester

Scientific Computing Laboratory/ Parallel Computing Laboratory

Usage of FORTRAN 77/90 for implementation of following programs.

(i) Finding the root of a non linear equation by (a) Bisection Method (b) Newton Raphson method.
(ii) Two point and three point numerical differentiation with error estimates.
(iii) Integration by Simpson rule with error estimate.
(iv) Integration by Gaussian Quadra rule with error estimate.
(v) Solving an ordinary differential equation using four point Runge Kutta Method with error estimate and control.
(vi) Solution of a system of Linear equations by Gaussian-elimination Method.
(vii) Diagonalization of Real symmetric Matrix.
(viii) Evaluating a 3 dimensional integral using Monte Carlo method of integration.

Parallel Programming: -

Developing following elementary programs in FORTRAN 77/C for implementation on Parallel machines.

(i) Fork and Node identity
(ii) Expression evaluation
(iii) Matrix Addition
(iv) Matrix Multiplication
(v) Linear curve fit
(vi) Gaussian elimination
(vii) Simpson's 1/3rd rule.

6th Semester

SEMINAR

The Seminar will be on topics of current technologies in the area of Information Technology student will select a topic of his/her interest and present a seminar to the faculty and students of his branch of Engineering.

The student will also submit a term paper on the topic of his seminar. Participation in this seminar will be compulsory.

The grading will be done by a team consisting of Head of the Department and two faculty member of the concerned branch. The candidate will be grades as

a) V. Good
b) Good
c) Fair
d) Poor

6th Semester