

MCA-620 E-I MOBILE & WIRELESS COMMUNICATION

Maximum Time : 3 Hrs.
Total Marks : 100
Minimum Pass Marks : 40%

University Examination : 70 Marks
Continuous Internal Assessment : 30 Marks

(A) Instructions for the Paper setter:

The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will

cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:

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

SECTION A

Application, History, Market, reference model and overview, Wireless Transmission Frequencies, Signals, Antennas, Signal propagation, Multiplexing, Modulation, Spread spectrum, Cellular system.

SECTION B

MAC and Telecommunication system :

Specialized MAC, SDMA, FDMA, TDMA – fixed TDM, Classical ALOHA, slotted, ALOHA, CSMA, DAMA, PKMA, Reservation TDMA, Collision avoidance, Polling inhibit sense multiple access. (DMA, Comparison, CSM-Mobile services, Architecture radio interface, Protocol, Localization, Calling, Handover, Security, New Data services, Introduction to WLL.

SECTION C

SATELLITE & BROADCAST SYSTEM :

History, Applications, GLO, LLO, MLO, Routing, Localization, Handover in satellite.

Wireless LAN: -

IEEE 802.11- Systems and Protocol architecture, Physical layer, MAC layered management, Bluetooth-user scenarios, Physical Layer, MAC layer, Networking security and link management.

SECTION D

Mobile Network Layers

Mobile IP Goals, Assumption, requirement, entities, terminology, IP packet delivery, Agent advertisement and discovery, registration, tunneling, encapsulation, optimization, reverse tunneling, IPV6.

DFCP, ADHOC Network :- Routing, destination sequences distance vector, dynamic source routing, hierarchical algorithm, alternative metric.

Reference:-

1. Raj Pandya, "Mobile and personal communication system and services", PHI

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SECTION A

Neural Network :- History, overview of biological Neuro-system, Mathematical models of neurons, ANN architecture, Learning rules, learning paradigms- Supervised, Unsupervised and reinforcement learning, ANN training algorithms-perceptions, Training rules, Delta, Back Propagation algorithm, Multilayer perception model, Training rules, Delta, Back Propagation Algorithm, Multilayer Perception Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks.

SECTION B

Fuzzy Logic :- Introduction to Fuzzy Logic, Classical and fuzzy sets : Overview of classical

sets, Membership function, Fuzzy rule generation.

Operations on Fuzzy sets : complement, Intersections, Unions, Combinations of Operations, Aggregation Operations.

SECTION C

Fuzzy Arithmetic : Fuzzy Number Linguistic variables, Arithmetic Operations on intervals & Numbers, Lattice on Fuzzy Numbers, Fuzzy equations.

Fuzzy Logic : Classical logic, Multivalued logic, Fuzzy propositions, Fuzzy qualifiers, linguistic hedges.

SECTION D

Uncertainty based information : Information & Uncertainty, Nonspecificity of Fuzzy & crisp sets, Fuzziness of Fuzzy sets.

Reference:-

1. J.Klir and George "Fuzzy sets and Fuzzy logic", PHI
2. E.Rich & K.night "Artificial Intelligence", TMH.

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SECTION A

Matrix – Matrix addition, subtraction, Multiplication, transpose, Adjoint of Matrix, Inverse of Matrix, Matrix method, Determinant, Properties of Determinant, Skew symmetric, Hermitian, Skew-Hermitian, Orthogonal Matrix.

SECTION B

Function, Limit, Continuity, Different type of function, Differentiation :- First Principle, Polynomial differentiation, Trigonometric function development, Inverse Trigonometric function, deviation, Application of Derivatives Tangent, Normal, Maxima, Rolle's Theorem, LMV Theorem.

SECTION C

Integration :- Polynomial Integration, Substitution method, By parts, Trigonometric function integration, Inverse trigonometric function integration, standard integral, Definite integral, area under the curve.

Differential equation :- Order and degree of differential equation, Variable separable, Homogenous equation, Linear equation (Integration factor).

SECTION D

Regression and correlation, Karl's person coefficient, Solution of regression lines, Probability, Binomial distribution, Poisson distribution, Normal distribution.

Vector :- Vector arithmetic, Triangle law, Parallelogram law, Scalar product, vector product, triple product (Scalar, Vector)

References:

1. B.S. Grewal, "Engineering Mathematic".
2. R.D. Sharma, "Mathematics by".
3. Parmanand Gupta, "Comprehensive Mathematics by", Laxmi Publication.

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SECTION A

Role of lexical analyzer, Input buffering, specification of tokens, Recognition of tokens, from regular expression to NFA, DFA based pattern matching.

SECTION B

Role of parser, recursive descent parser, predictive parser, operator precedence parser , LR parsing (SLR, CLR, LALR).

SECTION C

Syntax directed definitions, construction of syntax trees, Bottom up evaluation of S-attributed definitions ; attributed definitions, top-down translators, Bottom up evaluation of inherited attributed.

Intermediate code generation, declarations, assignment statements, Boolean expressions, Back-patching.

SECTION D

Code generation, issues, basic blocks & flow graph, Next an information, Dag representation basic blocks, Generating code from Dags.

Code optimization techniques, Principle source of optimization, (function preserving transformations, common subexpressions, Copy propagation, Dead lock elimination, Loop optimization, code motion, Reduction in strength.)

Reference:-

1. Aho and Ulman "Principle of compiler", Narosa Publishing House,1986
2. Aho and Ulman, Sethi : "Compiler, Principles, Techniques and tools" Addison coesley Publishing co. 1988.

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SECTION A

Distributed V/s Network O.S

Issues in distributed operating system, Global knowledge, Naming, Scalability, Compatibility, Process synchronization, Reserve management, Securing, structuring, compatibility, Process synchronization, Reserve management, securing, structuring, Lamport's logical clock, conditions satisfied by Lamport's clock. Virtual time V/s Physical time, limitation of Lamport's clocks, Vector clock.

SECTION B

Casual ordering of messages : Birman- Schipher – Stephonson protocol , Schiper-egglisandoz protocol.

Mutual exclusion, Requirements of mutual exclusion, performance measurement, token & Non token based algorithm, Lamport's algorithm, Ricort– Agrawala algorithm, Mackawa's algorithm.

SECTION C

Goals of Distributed file system, Architecture of Distributed file system, mechanisms for building file systems (Mounting, Hint, Bulk transfer, Encryption), Design issues.

SECTION D

Access control matrix, Limitations of access matrix, capabilities capability based addressing, advantages & disadvantages of capabilities, Access control list method, key-lock method, take-grant model, Bel-lapadula model.

Reference:-

1. Sasikeemar Shikhane and prekash, "Introduction to parallel toparallel processing", PHI 2000
2. Silberschaty and Galvin, "Operating system Concepts"(5th Edition), Addison wisely Publihing co.1999.
3. R.K. Sinha, "Discribed Operating system", PHI,1998

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SECTION A

Definition of Graph, Types of Graph, Application of Graph, Finite and Infinite Graph, Incidence & Degree.

Path & Circuit :- Isomorphism, Sub graph, walks, Path and Circuits, Connected Graph, connectivity, Component, Euler graph, Operation on graph, Hamiltonian path & circuit, traveling salesman problem.

SECTION B

Tree & fundamental circuit : Tree, Properties of Tree, Pendant vertices in a tree, Distance, Radius & Centre in Tree, Rooted Binary tree, Spanning tree, Fundamental circuit. Cut set & Cut-Vertices :- cut sets, Properties of cutset, Fundamental circuit & cut set.

SECTION C

Planner and Dual Graph :- Combinational V/s Geometrical Graph, Planner Graph, Kuratowski's two graph, Detection of Planarity.

SECTION D

Matrix representation of Graph: - Incidence Matrix, path matrix, coloring, covering, Partitioning, Chromatic number, Chromatic Partitioning, Polynomial, Matching covering, The four colour problem, Introduction about directed graph.

Reference:-

1. Narsing Deo, "Graph Theory", PHI Pvt. Ltd., 1997
2. Lipschutz, "Data Structures", TMA
3. Sartaj Sahni, "Data Structures Algorithms and application in C++", TMH