MCA-14-45(I) INFORMATION SECURITY

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Information Security Concepts: Background and Current Scenario, Types of Attacks, Goals for Security. Security Threats and Vulnerabilities: Overview of Security threats, Weak / Strong Passwords and Password Cracking, Insecure Network connections, Malicious Code, Programming Bugs . Wireless Networks and Security: Components of wireless networks, Security issues in wireless

UNIT – II

Basic encryption and decryption, Applications of Cryptography, Encryption techniques, Characteristics of good encryption systems, Secret key cryptography, Digital Signatures, Data Encryption Standard, International Data Encryption Algorithm, Advanced Encryption Standard, Hash and MAC algorithms.

UNIT – III

Secure sockets, IPsec overview, IP security architecture, IPSec-Internet Key, Exchanging(IKE), IKE phases encoding, Internet security, Threats to privacy, Packet sniffing, Spoofing , Web security requirements, Real Time communication security, Security standards–Kerberos.X.509AuthenticationService.

UNIT – IV

Security protocols, Transport layer protocols, Electronic mail security, PEM and S/MIME security protocol, Pretty Good Privacy, Web Security, Firewalls design principle, Trusted systems, Electronic payment protocols. Intrusion Detection, Password Management, Viruses and related Threats – Virus Counter measures, Virtual Private Networks.

Reference Books:

1. William Stallings, “Cryptography and Network Security: Principles and Standards”, Prentice Hall India.
2. Edward Amoroso, "Fundamentals of Computer Security Technology", Prentice-Hall, 1999
3. William Stallings, "Network Security Essentials", 3rd Edition, Pearson Education, 2006.
4. Bruce Schneier, “Applied Cryptography: Protocols, Algorithms, and Source Code in C”, Wiley India Pvt. Ltd.

MCA-14-45(II) ARTIFICIAL INTELLIGENCE

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT-I

Introduction: Background and history, Overview of AI applications areas.

The predicate calculus: Syntax and semantic for propositional logic and FOPL, Clausal form, inference rules, resolution and unification.

Knowledge representation: Network representation-Associative network & conceptual graphs, Structured representation- Frames & Scripts.

UNIT-II

Search strategies: Strategies for state space search-data driven and goal driven search; Search algorithms-uninformed search (depth first, breadth first, depth first with iterative deepening) and informed search (Hill climbing, best first, A* algorithm, mini-max etc.), computational complexity, Properties of search algorithms - Admissibility, Monotonicity, Optimality, Dominance.

UNIT-III

Production system: Types of production system-commutative and non-commutative production systems, Decomposable and non-decomposable production systems, Control of search in production systems.

Rule based expert systems: Architecture, development, managing uncertainty in expert systems - Bayesian probability theory, Stanford certainty factor algebra, Nonmonotonic logic and reasoning with beliefs, Fuzzy logic, Dempster/Shaffer and other approaches to uncertainty.

UNIT-IV

Knowledge acquisition: Types of learning, learning by automata, genetic algorithms, intelligent editors, learning by induction.

Natural Language Processing (NLP): Problems in understanding natural languages, Different stages of language analysis, Chomsky Hierarchy of formal languages, Transition network parsers (TNP), Augmented Transition network parsers (ATNP).

Text Books:

1. George F. Luger, Artificial Intelligence, Pearson Education.
2. Dan W. Patterson Introduction to Artificial Intelligence and Expert system, PHI.

Reference Books:

1. Ben Coppin, Artificial Intelligence Illuminated, Narosa Publishing House.
2. Eugene Charniak, Drew McDermott Introduction to Artificial Intelligence, Pearson Education.
3. Nils J. Nilsson Principles of Artificial Intelligence, Narosa Publishing House.
4. Jackson Peter, Introduction to Expert systems, 3rd ed., Pearson-Education.

MCA-14-45(III) INFORMATION SYSTEMS

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Fundamental of Management Information systems: The Fundamental Roles of Information System in business, Trends in Information Systems, Types of Information Systems, Managerial Challenges of Information Technology.

The Components of Information Systems: System Concept, Components of an Information System, Information System Resources, Information System Activities, Recognizing Information Systems

UNIT – II

IT Infrastructure and Emerging Technologies: - IT Infrastructure, Infrastructure Components, Software/Hardware Platform Trends and Emerging Technologies, Management Issues.

Foundation of Business Intelligence: Databases and Information Management: Organizing Data in a Traditional File Environment, The Database Approach to Data Management, Using Database to Improve Business Performance and Decision Making, Managing Data Resources.

UNIT – III

Securing Information Systems: - System Vulnerability and Abuse, Business Value of Security and Control, Establishing a Framework for Security and Control, Technologies and Tools for Security.

Key System Applications for the Digital Age

Enterprise Applications: - Enterprise Systems, Supply Chain Management Systems, Customer Relationship Management Systems, Enterprise Applications: New Opportunities and Challenges.

UNIT – IV

Managing Knowledge: - The Knowledge Management Landscape, Enterprises-Wide Knowledge Management Systems, Knowledge Work Systems, Intelligent Techniques.

Enhancing Decision Making: - Decision Making and Information Systems, Systems for Decision Support, Executive Support Systems (ESS), Group Decision-Support Systems (GDSS).

Text Books:

1. Kenneth C.Laudon, Jane P.Laudon, Management Information Systems Managing the Digital Firm, 10th Edition, Pearson Education.
2. James A O'Brien, George M Marakas, Management Information Systems, 7th Edition, Tata McGraw-Hill.

Reference Books:

1. Laudon & Laudon, Essentials of Management Information Systems, 8/e Pearson Education.
2. McLeod & Schell, Management Information Systems, 10/e, Pearson Education.
3. Rahmatian, Management Information Systems: Learning Exercises and Applications, 1/e Pearson Education.
4. Jawadekar, W.S., Management Information Systems, 2/e, Tata McGraw-Hill.
5. Robert G.Mudrick, Coel E.Ross, James R.Claggett,Information Systems for Modern Management.
6. James A.O'Brien, Management Information Systems.

MCA-14-45(IV) SECURITY IN COMPUTING

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Computer Security Concepts, Threats, Attacks and Assets, Security Functional Requirements, Security Architecture and Scope of Computer Security, Computer Security Trends, Computer Security Strategies. Program Security: Secure Program, Non-malicious Program Error, Viruses and other Malicious Code, Targeted Malicious Code, Control against Program Threats.

UNIT – II

Database Security: Database Management System, Relational Databases, Database Access Control, Inference, Security Requirements, Reliability and Integrity, Sensitive Data, Database Encryption.

Network Security: Threats in Network, Network Security Controls, Firewall- Need for firewall, Characteristics, Types of firewall, Firewall Basing, Intrusion Detection System- Types, Goals of IDS, IDS strengths and Limitations.

UNIT – III

Internet Security Protocols and Standards: Secure Socket Layer (SSL) and Transport Layer Security (TLS), IPv4 and IPv6 Security, Kerberos 672, X.509 678, Public Key Infrastructure.

Linux Security Model, File System Security, Linux Vulnerability, Linux System Hardening, Application Security.

Window Security Architecture, Windows Vulnerability, Windows Security Defense, Browser Defenses.

UNIT – IV

Physical Security Threats, Physical Security Prevention and Mitigation Measures, Recovery form Physical Security Breaches, Security Auditing Architecture, Security Audit Trail, Security Risk assessment, Security Controls or Safeguard, IT Security Plan, Cybercrime and Computer Crime, Intellectual Property, Privacy, Ethical Issues.

Reference Books:

1. Charles. P. Pfleeger & Shari Lawrence Pfleeger, Security in Computing, fourth edition, Pearson Education, 2006.ISBN: 978-81-317-2725-6.
2. William Stalling, Lawrie Brown, “Computer Security Principles and Practice”, First edition, Pearson Education, 2010. ISBN: 978-81-317-3351-6.