ADHOC NETWORKS

Subject   Code

:

06CS841	🗆 🗆 🗆

IA   Marks

:

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

INTRODUCTION: Ad hoc Networks: Introduction, Issues in Ad hoc wireless networks, Ad hoc wireless internet.

                              6 Hours

UNIT - 2

MAC – 1: MAC Protocols for Ad hoc wireless Networks: Introduction, Issues in designing a MAC protocol for Ad hoc wireless Networks, Design goals of a MAC protocol for Ad hoc wireless Networks, Classification of MAC protocols, Contention based protocols with reservation mechanisms.

7 Hours

UNIT - 3

MAC – 2: Contention-based MAC protocols with scheduling mechanism, MAC protocols that use directional antennas, Other MAC protocols.

6 Hours

UNIT - 4

ROUTING – 1:□□□ Routing protocols for Ad hoc wireless Networks: Introduction, Issues in designing a routing protocol for Ad hoc wireless Networks, Classification of routing protocols, Table drive routing protocol, On-demand routing protocol.

7 Hours

PART-B

UNIT - 5

ROUTING – 2: Hybrid routing protocol, Routing protocols with effective flooding mechanisms, Hierarchical routing protocols, Power aware routing protocols.

6 Hours

UNIT - 6

TRANSPORT LAYER: Transport layer protocols for Ad hoc wireless Networks: Introduction, Issues in designing a transport layer protocol for Ad hoc wireless Networks, Design goals of a transport layer protocol for Ad hoc wireless Networks, Classification of transport layer solutions, TCP over Ad hoc wireless Networks, Other transport layer protocols for Ad hoc wireless Networks.

7 Hours

UNIT - 7

SECURITY: Security: Security in wireless Ad hoc wireless Networks, Network security requirements, Issues & challenges in security provisioning, Network security attacks, Key management, Secure routing in Ad hoc wireless Networks.

6 Hours

UNIT - 8

QoS: Quality of service in Ad hoc wireless Networks: Introduction, Issues and challenges in providing QoS in Ad hoc wireless Networks, Classification of QoS solutions, MAC layer solutions, network layer solutions.

7 Hours

TEXT BOOK:

1.   **Ad hoc Wireless Networks** – C. Siva Ram Murthy & B. S. Manoj, 2nd Edition, Pearson Education, 2005.

REFERENCE BOOKS:

1. **Ad   hoc Wireless Networks** – Ozan K. Tonguz and Gianguigi Ferrari, John   Wiley, 2006.
2. **Ad   hoc Wireless Networking –** Xiuzhen Cheng, Xiao Hung, Ding-Zhu Du,   Kluwer Academic Publishers, 2004.
3. **Adhoc Mobile   Wireless Networks -** C.K. Toh, Protocols and Systems, Prentice-Hall PTR, 2002.

SOFTWARE TESTING

| Subject   Code |

:

06CS842/IS81

| IA   Marks |

:

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

BASICS OF SOFTWARE TESTING – 1: Human Errors and Testing; Software Quality; Requirements, Behavior and Correctness; Correctness versus Reliability; Testing and Debugging; Test Metrics.

6 Hours

UNIT - 2

BASICS OF SOFTWARE TESTING – 2: Software and Hardware Testing; Testing and Verification; Defect Management; Execution History;Test-generation Strategies, Static Testing. Model-Based Testing and Model Checking; Control-Flow Graph; Types of Testing; The Saturation Effect.

6 Hours

UNIT - 3

TEST GENERATION FROM REQUIREMENTS – 1: Introduction; The Test-Selection Problem; Equivalence Partitioning; Boundary Value Analysis; Category-Partition Method.

7 Hours

UNIT - 4

TEST GENERATION FROM REQUIREMENTS – 2: Cause-Effect Graphing, Test Generation from Predicates.

7 Hours

PART - B

UNIT - 5

STRUCTURAL TESTING: Overview; Statement testing; Branch testing; Condition testing, Path testing; Procedure call testing; Comparing structural testing criteria; The infeasibility problem.

6 Hours

UNIT - 6

DEPENDENCE, DATA FLOW MODELS, AND DATA FLOW TESTING: Definition-Use pairs; Data flow analysis; Classic analyses; From execution to conservative flow analysis; Data flow analysis with arrays and pointers; Inter-procedural analysis; Overview of data flow testing; Definition-Use associations; Data flow testing criteria; Data flow coverage with complex structures; The infeasibility problem.

6 Hours

UNIT - 7

TEST CASE SELECTION AND ADEQUACY, TEST EXECUTION: Overview; Test specification and cases; Adequacy criteria; Comparing criteria; Overview of test execution; From test case specification to test cases; Scaffolding; Generic versus specific scaffolding;

Test oracles; Self-checks as oracles; Capture and replay.

6 Hours

UNIT - 8

PROCESS: Test and analysis activities within a software process: The quality process; Planning and monitoring; Quality goals; Dependability properties; Analysis; Testing; Improving the process; Organizational factors.

Integration and component-based software testing: Overview; Integration testing strategies; Testing components and assemblies. System, Acceptance and Regression Testing: Overview; System testing; Acceptance testing; Usability; Regression testing; Regression test selection techniques; Test case prioritization and selective execution.

8 Hours

TEXT BOOKS:

1. **Foundations of Software Testing -** Aditya P   Mathur, Pearson Education, 2008.
2. **Software Testing and Analysis: Process, Principles and Techniques** – Mauro Pezze, Michal Young, John   Wiley & Sons, 2008.

REFERENCE BOOKS:

1. **Software   testing Principles and Practices** – Gopalaswamy Ramesh, Srinivasan Desikan, 2nd
   Edition, Pearson, 2007.

2. **Software   Testing**   – Ron Patton, 2nd edition, Pearson Education, 2004.
3. **The Craft of   Software Testing** – Brian Marrick, Pearson Education, 1995.

ARM BASED SYSTEM DESIGN

Subject   Code

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06CS843	🗆🗆🗆

IA   Marks

:

25

Elective V

Written by Administrator
Sunday, 08 November 2009 10:19 -

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

INTRODUCTION: The RISC design philosophy; The ARN design philosophy; Embedded system hardware and software. ARM processor fundamentals: Registers; Current Program Status Register; Pipeline; Exceptions, interrupts and the Vector Table; Core extensions; Architecture revisions; ARM processor families.

6 Hours

UNIT - 2

ARM INSTRUCTION SET AND THUMB INSTRUCTION SET: ARM instruction set: Data processing instructions; Branch instructions; Load-store instructions; Software interrupt instruction; Program Status Register functions; Loading constants; ARMv5E extensions; Conditional execution. Thumb instruction set: Thumb register usage; ARM –Thumb

interworking; Other branch instructions; Data processing instructions; Single-Register Load-Store instructions; Multiple-Register Load-Store instructions; Stack instructions; Software interrupt instruction.

7 Hours

UNIT - 3

WRITING AND OPTIMIZING ARM ASSEMBLY CODE: Writing assembly code; Profiling and cycle counting; Instruction scheduling; Register allocation; Conditional execution; Looping constructs; Bit manipulation; Efficient switches; Handling unaligned data.

6 Hours

UNIT - 4

OPTIMIZED PRIMITIVES: Double-precision integer multiplication; Integer normalization and count leading zeros; Division; Square roots; Transcendental functions; Endian reversal and bit operations; Saturated and rounded arithmetic; Random number generation.

7 Hours

PART - B

UNIT - 5

EXCEPTION AND INTERRUPT HANDLING: Exception handling; Interrupts and interrupt handling schemes.

□□□
□□**7 Hours**

UNIT - 6

CACHES: The memory hierarchy and the cache memory; Cache architecture; Cache policy; Coprocessor 15 and cache; Flusing and cleaning cache memory; Cache lockdown; Caches and software performance.

7 Hours

UNIT - 7

MEMORY – 1: Memory Protection Units: Protected regions; Initializing the MPU, cache and write buffer; Demonstration of an MPU system. Memory Management Units: Moving from MPU to an MMU; How virtual memory works; Details of the ARM MMU.

6 Hours

UNIT - 8

MEMORY – 2: Page tables; The translation look aside buffer; Domains and memory access permission; The caches and write buffer; Coprocessor 15 and MMU configuration; The fast context switch extension.

6 Hours

TEXT BOOK:

1.   **ARM System Developer's Guide – Designing and Optimizing System Software** – Andrew N. Sloss, Dominic Symes, Chris Wright, Elsevier, 2004.

REFERENCE BOOKS:

1. **ARM   Architecture Reference Manual** – David Seal   (Editor), 2nd Edition, Addison-Wesley, 2001.

2. **ARM System-on-Chip Architecture –** Steve Furber,   2nd Edition, Addison-Wesley, 2000.

SERVICES ORIENTED ARCHITECTURE

Subject   Code

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06CS844	🞏 🞏 🞏

IA   Marks

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25

No. of Lecture Hrs./ Week

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04

Exam Hours

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03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

INTRODUCTION TO SOA, EVOLUTION OF SOA: Fundamental SOA; Common Characteristics of contemporary SOA; Common tangible benefits of SOA; An SOA timeline (from XML to Web services to SOA); The continuing evolution of SOA (Standards organizations and Contributing vendors); The roots of SOA (comparing SOA to Past architectures).

7 Hours

UNIT - 2

WEB SERVICES AND PRIMITIVE SOA: The Web services framework; Services (as Web services); Service descriptions (with WSDL); Messaging (with SOAP).

6 Hours

UNIT - 3

WEB SERVICES AND CONTEMPORARY SOA – 1: Message exchange patterns; Service activity; Coordination; Atomic Transactions; Business activities; Orchestration; Choreography.

6 Hours

UNIT - 4

WEB SERVICES AND CONTEMPORARY SOA – 2: Addressing; Reliable messaging; Correlation; Polices; Metadata exchange; Security; Notification and eventing.

7 Hours

PART - B

UNIT - 5

PRINCIPLES OF SERVICE – ORIENTATION: Services-orientation and the enterprise; Anatomy of a service-oriented architecture; Common Principles of Service-orientation; How service orientation principles inter-relate; Service-orientation and object-orientation; Native Web service support for service-orientation principles.

7 Hours

UNIT - 6

SERVICE LAYERS: Service-orientation and contemporary SOA; Service layer abstraction; Application service layer, Business service layer, Orchestration service layer; Agnostic services; Service layer configuration scenarios.

6 Hours

UNIT - 7

BUSINESS PROCESS DESIGN: WS-BPEL language basics; WS-Coordination overview; Service-oriented business process design; WS-addresing language basics; WS-Reliable Messaging language basics.

7 Hours

UNIT - 8

SOA PLATFORMS: SOA platform basics; SOA support in J2EE; SOA support in .NET; Integration considerations.

6 Hours

TEXT BOOK:

1.   **Service-Oriented Architecture – Concepts, Technology, and Design -**Thomas Erl, Pearson Education, 2005.

REFERENCE BOOK:

   1. **Understanding SOA with Web Services** – Eric   Newcomer, Greg Lomow, Pearson Education, 2005.

GRID COMPUTING

Subject   Code

:

	06CS845	

IA   Marks

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25

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

Elective V

PART - A

UNIT - 1

INTRODUCTION, GRID COMPUTING ORGANIZATIONS AND THEIR ROLES: Early Grid Activities, Current Grid Activities, An Overview of Grid Business Areas,

Grid Applications, Grid Infrastructure.

Organizations Developing Grid Standards and Best Practice Guidelines, Organizations Developing Grid
Computing Toolkits and the Framework, Organizations Building and Using Grid-Based Solutions to Solve Computing, Data and Network Requirements, Commercial Organizations Building and Using Grid-Based Solutions
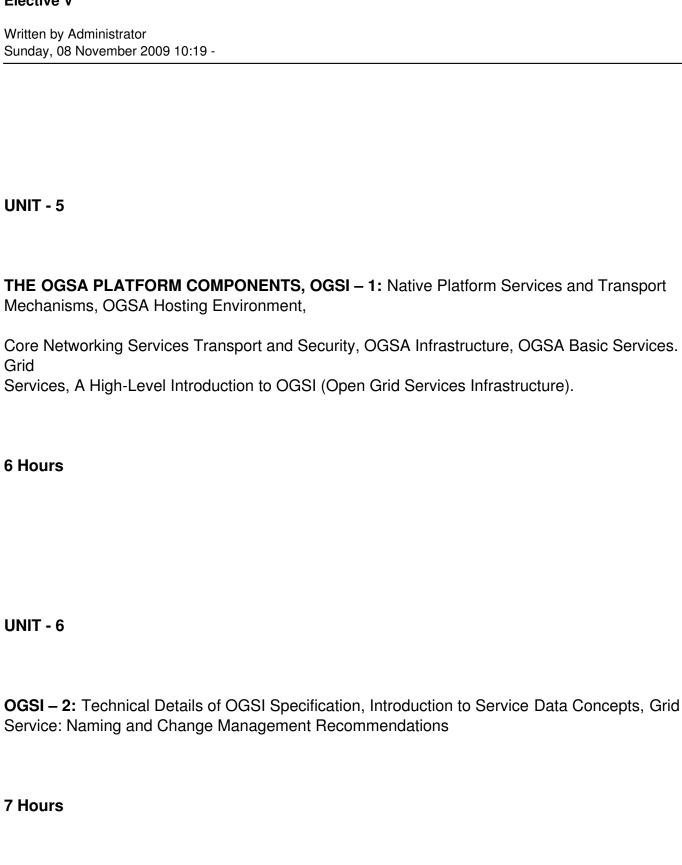
6 Hours

UNIT - 2

THE GRID COMPUTING ANATOMY, ROAD MAP: The Grid Problem. Anatomy Computing, Business on Demand and Infrastructure Virtualization, Service-Oriented Architecture and Grid, Semantic Grids.

6 Hours

UNIT - 3

ARCHITECTURES – 1: Service-Oriented Architecture, Web Services Architecture, XML, Related Technologies and Their Relevance to Web Services, XML Messages and Enveloping, Service Message Description Mechanisms.

7 Hours

UNIT - 4

ARCHITECTURES – 2: Relationship between Web Service and Grid Service, Web Service Interoperability and the Role of the WS-I Organization, OGSA   Architecture and Goals,
Commercial Data Center (CDC), National Fusion Collaborator (NFS), Online Media and Entertainment

7 Hours

PART - B

UNIT - 5

THE OGSA PLATFORM COMPONENTS, OGSI – 1: Native Platform Services and Transport Mechanisms, OGSA Hosting Environment,

Core Networking Services Transport and Security, OGSA Infrastructure, OGSA Basic Services. Grid
Services, A High-Level Introduction to OGSI (Open Grid Services Infrastructure).

6 Hours

UNIT - 6

OGSI – 2: Technical Details of OGSI Specification, Introduction to Service Data Concepts, Grid Service: Naming and Change Management Recommendations
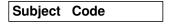
7 Hours

UNIT - 7

OGSA BASIC SERVICES – 1: Common Management Model (CMM), Service Domains, Policy Architecture, Security Architecture, Metering and Accounting.

7 Hours

UNIT - 8

OGSA BASIC SERVICES - 2, TOOLKIT: Common Distributed Logging, Distributed Data Access and Replication. GLOBUS GT3 Toolkit Architecture.

6 Hours

TEXT BOOK:

1.   **Craig Fellenstein: Grid Computing** – Joshy Joseph, IBM Press, 2007.

REFERENCE BOOK:

1.   **Grid and Cluster Computing, Prentice** – Prabhu, Prentice Hall of India, 2007.

PROGRAMMING LANGUAGES

Subject   Code

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06CS846	⬜ ⬜ ⬜

IA   Marks

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25

No. of Lecture Hrs./ Week

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04

Exam Hours

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03

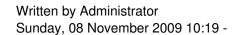Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1
INTRODUCTION; NAMES, SCOPE, AND BINDINGS – 1: Language design; Programming language spectrum; Why study programming languages? Compilation and interpretation; Programming environments. Names, scope, and bindings: Concept of binding time; Object lifetime and storage management; Scope rules and implementing scope.

7 Hours

UNIT - 2

NAMES, SCOPE, AND BINDINGS – 1; CONTROL FLOW – 1: The binding of reference environments; Binding within a scope; Separate compilation. Control Flow – 1: Expression evaluation.

7 Hours

UNIT - 3

CONTROL FLOW – 2: Structured and unstructured flow; Sequencing; Selection; Iteration; Recursion; Non-determinacy.

6 Hours

UNIT - 4
DATA TYPES – 1: Type systems; Type checking; Records and variants; Arrays.

6 Hours

PART - B

UNIT - 5
DATA TYPES - 2: Strings; Sets; Pointers and recursive types; Lists; Files and Input/Output; Equality testing and assignment.

7 Hours

UNIT - 6
Subroutines and Control Abstraction - 1: Review of stack layout;

Calling sequences; Parameter passing; Generic subroutines and modules; Exception handling.
6 Hours

UNIT - 7

CONTROL ABSTRACTION – 2; DATA ABSTRACTION, OBJECT ORIENTATION: Control abstraction – 2: Coroutines. Data Abstraction, Object Orientation: Object oriented programming; Encapsulation and Inheritance; Dynamic method binding; Multiple inheritance; Object oriented programming revisited.

6 Hours

UNIT - 8□□□□
FUNCTIONAL LANGUAGES, LOGIC LANGUAGES, SCRIPTING LANGUAGES : □□□□□□□□□Functional Labguages: Origins; Concepts; An overview of scheme; Evaluation order revisited; Higher-order functions; Functional programming in perspective. Logic Languages: Concepts; Prolog; Logic programming in perspective. Scripting Languages: Common characteristics.

7 Hours

TEXT BOOK:

1.   **Programming Language Pragmatics** – Michael L. Scott, 2nd Edition, Elsevier, 2006.

REFERENCE BOOKS:

   1. **Programming   Languages Concepts and Constructs** – Ravi Sethi, 2nd Edition, Pearson Education, 1996.

   2. **Programming Languages** – Allen   Tucker, Robert Nonan, Tata McGraw-Hill, 2002.