

(IT-452) Information Technology Applications

L	T	Exam	Sessional	Duration
4	1	100	25	3Hrs.

Unit-1

History of IT, Basic Information Technology Concepts. Human-Computer Interface, Social Implication of IT, privacy and Security

Unit-2

Integrated management information, Seamless Integration, Supply Chain management, Integrated Data Model, Benefits of ERP. Business Engineering and ERP, Definition of Engineering, Principles of Business Engineering, Business Engineering with Information Technology, Building the Business Model ERP Implementation- An overview, Role of Consultant, Vendors and Users, Customization, Precautions, ERP post Implementation options, ERP Implementation Technology, Guidelines for ERP Implementation. ERP Domain MPG /PRO, IFS / Avalon-Industrial and Financial System, BAN-IV, SAP Marketing of ERP- Market Dynamics and Dynamic strategy.

Unit-3

SAP, SAP past present and future, The integrated R/3 repository, Enterprise and modeling with R/3, Object of R/3 data dictionary, Customizing R/3 : Concepts and techniques

Unit-4

Multi Client Server Solution – Open Technology- User Interface- Applications Integration Basic architectural Concepts, The System Control Interface, Services-Presentation Interface-Database Interface

Books Recommended:

1. Jost Antonio Fernandez - The SAP R/3 Hand Book TMH New Delhi
2. V.K. Garg and N. K. Venkita Krishna, Enterprise Resource planning Concepts and Practice

Note: These will be 8 questions in all. Two questions will be set from each unit.

Students are required to attempt five questions selecting at least one question from each unit.

(IT-454) MOBILE COMMUNICATION

L	T	Exam	Sessional	Duration
4	1	100	25	3Hrs.

Unit-1

Introduction:

Introduction cell mobile system, tuning efficiency, mobile radio environment, frequency reuse, co channel interference reduction, and handoff mechanism cell site and mobile antennas, noncochannel interference. Frequency spectrum utility and management channel management, type of handoff and dropped call rate, cell splitting. Analog and digital modulation techniques, performance of various modulations, spectra efficiency, and error rate, GMSK, GFSK, DQPSK modulation technique in wireless system comparison of various modulation techniques.

Unit-2

Point to point model propagation over terrains, Losses, Power requirements, Smart Antennas, antennas at site, gain and pattern relationship mobile antennas, tilting effect, parasitic elements usage, diversity techniques.

Unit-3

Digital technology, digital speech, digital mobile telephony, GSM, Multiple access techniques, north TDMA, American TDMA (IS136), Japanese cellular TDMA (DDC), CDMA, IS95 North American CDMA standards, PCS, PHS, Advanced system, GPRS, UMTS, IMT, WAP.

Unit-4

Satellite system architecture, satellite orbit and constellations, LEO and MEO system, GPS Information, Iridium, MSAT, VSAT, DBS, Orbcomm satellite service, use of mobile communication networks, concepts, advanced mobile communication system using satellite,

Book Recommended

1. Rappaport T.S, "Wireless communication", Prentice Hall, NJ.
2. GSM, CDMA & 3G System-steel Lee and Gluis, JW.
3. K.FEHER-Wireless Digital engineering
4. Mobile Satellite communication Engineering-Richards Addison Wesley.
5. Lee, WCY, "Mobile Communication Engineering", TMH, New Delhi.

Note: Examiner will set 8 questions in all, at least two questions from each unit. Students are required to attempt five questions selecting at least one question from each unit.

(IT-456) Advance Computer Network & Applications

L	T	Exam	Sessional	Duration
4	1	100	25	3Hrs.

UNIT – 1

Introduction: Overview of computer networks, seven-layer architecture, TCP/IP suite of protocols, etc. MAC protocols for high-speed LANS, MANs, and wireless LANs. (For example, FDDI, DQDB, HIPPI, Gigabit Ethernet, Wireless Ethernet, ect.)

UNIT-2

Fast access technologies (For example, ADSL, Cable Modem, etc.) IPv6: Why IPv6, basic protocol, extensions and options, support for QoS, security, etc., neighbor discovery, auto-configuration, routing. Changes to other protocols. Applications Programming Interface for IPv6. 6 bone.

UNIT-3

Mobility in networks Mobile IP. Security related issues. IP Multicasting. Multicast protocols, address assignments, session discovery, etc. TCP extensions for high-speed networks, transaction-oriented applications. Other new options in TCP.

Network security at various layers. Secure-HTTP, SSL, ESP, Authentication header, Key, distribution protocols. Digital signatures, digital certificates.

UNIT-4

The Wireless Applications Protocols, applications environment, wireless application protocol client software, wireless application protocol gateways, implementing enterprise wireless application protocol strategy and Security Issues in Wireless LAN. Wireless network management, GPRS, and VOIP services. Network Management: Introduction, LAN, SNMP, and CMIP. Issues in the management of large networks. Multicast: IGMP, PIM, DVMRP

Books and References:

1. W.R. Stevens. TCP/IP Illustrated, Volume 1: The protocols, Addison Wesley, 1994.
2. G.R. Wright. TCP/IP Illustrated, Volume 2: The Implementation, Addison Wesley, 1995.
3. W.R. Stevens. TCP/IP Illustrated, Volume 3: TCP for Transactions, HTTP, NNTP, and the Unix Domain Protocols, Addison Wesley, 1996.
4. R. Handel, M.N. Huber, and S. Schroeder. ATM Networks. Concepts, protocols, Applications, Addison Wesley, 1998.
5. William Stalling, Wireless Communications and Networks. Prentice Hall 2002
6. Yi-Bring Lin, Imrich Chlamtac, Wireless and Mobile Network Architecture, John Wiley-2001.
7. M.R. Karim, Mohsen Sarrf, W-CHMA and cdma 2000 for 3G Mobile Networks, McGraw-Hill Professional, 2002.
8. W. Stallings. Cryptography and Network Security: Principles and practice, 2nd Edition, Prentic Hall, 1998.
9. C.E. Perkins, B. Woolf, and S.R. Alpert. Mobile IP: Design Principles and Practices, Addison Wesley, 1997.
10. Peter Loshin. IPv6 Clearly Explained, Morgan Kauffman, 1999.
11. M. Gonsalves and K. Niles. IPv6 Networks, McGraw Hill, 1998.
12. RFCs and Internet Drafts, available from Internet Engineering Task Force.

Articles in various journals and conference proceedings.

Note: Examiner will set 8 questions in all, at least two questions from each unit.
Students

are required to attempt five questions selecting at least one question from each unit.

(IT-468) Cryptography and Security System

L	T	Exam	Sessional	Duration
4	1	75	25	3Hrs.

UNIT-1

Introduction, Essentials of crypto, essentials of network mg and the internet, setting realistic security objectives, appropriate communication security, legal restrictions encryption basic building blocks, how crypto system fail, choosing between strong and weak crypto. Security objectives, example in line encryptor, deployment example, point-to-point encryption, IP routed configuration, key recovery and escrowed encryption, Basic issues in secret key management, random key generation, automatic rekeying, and manual key distribution centers, maintaining keys and system security.

Unit-2

Security at IP Layer and VPN: Basic issues with using IPSEC. Cryptographic checksums, Ip security protocol, IPSEC key management, other TCP/IP network security protocols, virtual private networks (VAN), basic issues IPSEC proxy cryptography, IPSEC encrypting roater, and site-to-site encryption. IPSEC and Public key crypto, basic issues with IPSEC clients.

Unit-3

IPSEC client to server site remote access, Internet firewalls, IPSEC firewall, a VAN with a firewall, public key cryptography, secret key exchange with RSA crypto, Secure socket layer (SSL) Internet security and public key certificates: Basic issues in internet transaction security, transaction world wise Web, security alternatives for web form, web browser with SSI,

Unit-4

Web server with server with SSL, vending with exportable encryption, basic issue with email security, technology- offline message keying digital signatures, secure E-mail client distribution public keys, Public key certificates, certificates distribution centralized distribution, centralized certification authority hierarchical certification authority.

Book Recommended:

1. Richard E-Smith, "Internet Cryptography", Addison Wesley, 2nd Ed.
2. Cryptography and network security – Principles and Practice by William Stallings- Pearson education

Revise: Examiner will set 8 questions in all, at least two questions from each unit.

Students are required to attempt five questions selecting at least one question from each unit.

(IT-470) Data Warehousing and Data Mining

L	T	Exam	Sessional	Duration
4	1	75	25	3Hrs.

UNIT-1

Introduction of Data Warehousing: The evolution of Data Warehousing (The Historical Context). The data warehousing – a brief history, today's development environment. Principles of Data Warehousing (Architecture and Design Techniques): Types of data and their uses, conceptual data architecture, design techniques, introduction to the logical architecture. Creating the Data Asset: Business Data Warehouse Design, Populating the Data Warehouse.

UNIT-2

Unlocking the Data Asset for end users (The use of Business Information) : Designing business information warehouse, populating business information warehouse, user access to information, information data in context. Implementing the Warehouse (Managing the project and environment) : Obstacles to implementation, planning your implementation, justifying the warehouse, organizational implications of data Warehousing, the data warehouse in your organization, data warehouse management, looking to the future.

UNIT-3

Introduction of Data Mining: Motivation, importance, data mining, kind of data, functionalities, interesting patterns, classification of data mining system, major issues. Data warehouse and OLAP technology for data mining : data warehouse, operational database systems and data warehouse architecture, implementation, development of data cube technology, data warehousing to data mining, data warehouse usage.

UNIT-4

Data Preparation: Preprocess, data cleaning, data integration and transformation, data reduction, discrimination and concept hierarchy generation. Data Mining Primitives, languages and system architectures, graphical user interfaces. Concept Description: Characterization and comparison data generalization and summarization based characterization, analytical characterization, and analysis of attribute relevance, mining class comparison, and mining descriptive statistical measures in large databases. Mining association rules in large databases, mining single dimensional Boolean association rules from transactional databases, mining multi-dimensional association rules from relational databases and data warehouses, from association to correlation analysis, constraint based association.

Books and Reference:

1. J. Han & M. Kanber, Data Mining: Concepts and Techniques, Morgan Kaufmann/ Elsevier, India, 2001
2. D. Hand, H. Mannila, & P. Smyth. Principles of Data Mining, MIT Press, 2001.
3. Recent literature from ACM SIGMOD, VLDB, IEEE Trans. Knowledge & Data Engg, Data Mining & Knowledge Discovery, ACM SIGKDD, IEEE ICDM, SIAM, Data Mining, ICML.
4. M. Jarke et al. fundamentals of Data Warehouses (2nd ed.), Springer, 2003, ISBN 3-540-42089-4.
5. C. Seidman, Data Mining with Microsoft SQL Server 2000 Technical Reference

Microsoft Press, ISBN 0-7356-1271-4.

Note: Examiner will set 8 questions in all, at least two questions from each unit.
Students

are required to attempt five questions selecting at least one question from each unit.

(IT-472) Distributed Computing

L	T	Exam	Sessional	Duration
4	1	75	25	3Hrs.

UNIT-I

Distributed systems- architecture. Key characteristics – resource sharing openness – concurrency –scalability- fault tolerance – transparency. Design issues –naming – communication- software structure – workload allocation – consistency maintenance. User requirement- functionality- quality of service- reconfigurability. Review of network protocols. Intercross communication- building blocks- client server communication group communication. Intercross communication in UNIX. Remote Procedure calling. Design issues- interface definition language exception handling. Implementation – interface processing- communication handling. Binding. Case study- sun RPC- Java RMI.

UNIT-II

Distributed Operating systems-kernel –processes and threads- Naming and protection- Communication and Invocation – virtual memory. Distributed file service – design issues – interfaces- implementation techniques. Case study sun NFS. Name service SNS and DNS. Time and co-ordination. Synchronizing physical clocks logical time and logical clocks. Distributed co-ordination- distributed mutual exclusion – elections. Replication – basic architectural model- consistency and request ordering.

UNIT-III

Shared data and transactions – client server- fault tolerance and recovery transactions- nested transactions. Concurrency control- locks- optimistic concurrency control- timestamp ordering. Distributed transactions- atomic commits protocols concurrency control distributed deadlocks- transactions with replicated data.

UNIT-IV

Recovery and fault tolerances. Transaction recovery- logging- shadow versions- fault model for transactions. Fault tolerance- characteristics. Hierarchical and group masking of faults. Security – authentication and key distribution- logic of authentication – digital signatures.

Text Books and References:

1. C.A.R. Hoara, “Communicating Sequential Processes”, Prentice Hall, 1980
2. Dimitri P. Bertsekas, John N. Tsitiklis, “Parallel and Distributed Computation : Numerical Methods”, Prentice Hall International, Inc, 1989
3. Douglas Comer and David L. Stevens, “Internetworking with TCP/IP Vol III: Client server programming and Applications”, Prentice Hall, New York, 1990
4. George Couloirs, et. Al “Distributed System – Concepts and Design”, Second ed, Addison Wesley, 2000
5. George Tel, “Introduction to Distributed Algorithms”, Cambridge University Press, 1994 6)
6. H.S.M. Sedan, “Distributed Computer system”, Butterworths, London, 1988
7. Joel M. Crichlow, “Introduction to Distributed and Parallel Computing”, Prentice Hall, New York, 1988 6. M. Sasikumar, et. Al. “introduction to Parallel Processing”, PHI, New
8. Distributed Systems Concepts and Design, George colulouris, Jean Dolli more, Time Kindberg, Pearson Education Asia, Third Edition 2001.

9. Principles of Distributed Database System, M Tamer Ozsu, Patrick Valduriez, Second Edition, PHI, 1999.

10. Distributed operating system, "P.K. Sinha", PHI

11. Advance operating system, "Mukesh Singhal", TMH

12. Advance database system, "Raghu Rama Krishan"

Note: Examiner will set 8 questions in all, at least two questions from each unit.

Students are required to attempt five questions selecting at least one question from each unit.

(IT-474) Embedded system

L	T	Exam	Sessional	Duration
4	1	75	25	3Hrs.

UNIT-I

CPU Architecture and programming: Embedded System Revolution, ARM Controller, architecture, addressing mode, Instruction Set, Special features – Analog DSP controllers Texas

UNIT-II

Embedded software: Examples of embedded system, their characteristic and their typical hardware components, embedded software architectures, round robin, round robin with interrupts, Function queue scheduling and real time operating system, selection. Real time operating system: Tasks and task states, tasks and date shard data and reentrancy, semaphores and shared data use of semaphores, protecting shard data.

UNIT-III

Features of Real Time Operating System: Messages, queues, mailboxes and paper, time function, events, memory management, interrupt basic system design using an RT (OS design principles, interrupt routines, task structures and priority.)

UNIT-IV

Examples of and embedded system design: Problem specification, resolving timing problem, use of an RTOS, work division into tasks dealing with shared data, encapsulating semaphores and queues, saving space and power.

Text Books and References:

1. AN Embedded Software Primer, David E. Simon Pearson Education Asia Publication
2. Frank vahid and TonoI Givargis- Embedded system Design
3. Wayne Wolf Computers as Components Principles of Embedded Computing system Design
4. John B peatman Embedded Design pict 18f452

(IT-460) Mobile Communication Lab

L T P
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Sessional: 50

Exam: 50

1. Observe the Modulation and demodulation using internal generation of 2047 bit PN sequence as modulator input and Bit error rate measurement with PRBS-11 data (2047 bits).
2. Study of home networking using combination of CDMA, BLUETOOTH, infrared Ethernet & various sensors like fire, gas air conditioning. Use at least five sensors
3. Understanding RF environment & study of GSM network by actually connecting to the GSM environment by any services provide SIM like airtel, idea, RPG ect.
4. Real time study of various GSM commands like Network registration, call control, call setting, call information, phone book commands & commands related to network information about number of cells and there strength etc.
5. To understanding the concept of GPS and establishing link between GPS Satellite & GPS Trainer.
6. To establish audio & video combined link & data communication between transmitters, receiver satellite transponder simulated in a lab.
7. To study and observe the difference in uplink & downlink frequency.
8. To establish PC-to-PC communication using satellite communication link.
9. To calculate antenna gain and antenna beam width.
10. Study and observe the Wave Modulation and Demodulation
11. To plot the radiation pattern of micro strip antennas.
12. Study and observe the antenna matching and antenna radiation with distance.

Note: Students should perform at least 10 experiments from the list