BACHELOR OF TECHNOLOGY (IGDTUW)
Computer Science and Engineering
(Teaching and Examination Scheme)
SEVENTH SEMESTER EXAMINATION

Sl. No.	Paper Code	Paper Title	L	P	Credits	Course Category
THEORY PAPERS						
1	BCS 401	Advance Computer Architecture	4	-	4	Departmental Core
2	BCS 403	Mobile Computing	4	-	4	Departmental Core
ELECTIVES-I (Choose Any One)						
1	BIT 401	Software Testing	4	-	4	Departmental Electives
2	BEC 401	Wireless Communication				
3	BIT 403	Big Data Analytics				
4	BCS 407	**Emerging trends in Computer Science and Engineering				
5	BCS 409	Soft Computing				
6	BCS 411	**Introduction to E-Commerce & M-Commerce				
ELECTIVES-II (Choose Any One)						
1	BMA 417	Process Improvement Techniques	3	-	3	Humanities & Social Sciences
2	BAS 419	Financial Accounting				
PRACTICAL/VIVA VOCE						
1	BCS 451	Advance Computer Architecture Lab	0	2	1	Departmental Core
2	BCS 453	Mobile Computing lab	0	2	1	Departmental Core
3	BCS 455	Practical based on Electives – I	0	2	1	Departmental Electives
4	BCS 457	*Minor Project	0	8	4	Departmental Core
5	BCS 459	Practical Training	-	-	2	Departmental Core
6	BAS 461	Disaster Management	-	2	1	Humanities & Social Sciences
		TOTAL	**15**	**14**	**25**	

*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

** Any of these subjects may be chosen in E-Learning mode and supervised by Internal Faculty-in-Charge.

BACHELOR OF TECHNOLOGY (IGDTUW)
Computer Science and Engineering
(Teaching and Examination Scheme)
EIGHTH SEMESTER EXAMINATION

Sl. No.	Paper Code	Paper Title	L	P	Credits	Course Category
THEORY PAPERS						
1	BCS 402	Embedded Systems Design	4	-	4	Departmental Core
2	BIT 404	Cyber Security and Management	4	-	4	Departmental Core
ELECTIVES-I (Choose any one)						
1	BCS 406	Real Time Systems	4	-	4	Departmental Electives
2	BIT 408	Natural Language Processing				
3	BCS 410	Advanced Database Management Systems				
4	BCS 412	**Wireless Sensor Networks				
5	BIT 414	IPR & Cyber Laws				
	ELECTIVES-II (Choose any one)					
1	BAS 420	Business Entrepreneurship	3	-	3	Humanities & Social Sciences
2	BAS 422	Organizational Behavior				
	PRACTICAL/VIVA VOCE					
1	BCS 452	Embedded Systems & Design Lab	0	2	1	Departmental Core
2	BIT 454	Cyber Security Management lab	0	2	1	Departmental Core
3	BCS 456	*Major Project	0	12	8	Departmental Core
		TOTAL	**15**	**16**	**25**	
GRAND TOTAL					**212**	

*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

** Any of these subjects may be chosen in E-Learning mode and Supervised by Internal Faculty-in-Charge.

NOTE: 1. Total number of the credits of the B.Tech. Programme = 212

2. Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn the minimum of 204 credits without excluding core exams.

Paper Code: BCS 401 **L P C**

Paper Title: Advanced Computer Architecture **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT I

Introduction to parallel processing: Necessity of high performance, Constraints of conventional architecture, Parallelism in uni-processor system, Evolution of parallel processors, future trends, Architectural Classification, Applications of parallel processing, Instruction level Parallelism and Thread Level Parallelism, Performance Metrics and Measures, Speedup Performance Laws **(10 Hrs)**

UNIT II

Pipelining Techniques : Linear Pipeline Processors , nonlinear pipeline processors, Instruction Pipeline Design- Instruction Execution Phases, Mechanisms for instruction pipelining, Dynamic Instruction Scheduling , Branch Handling Techniques , Arithmetic Pipeline Design - Computer Arithmetic Principles , Static Arithmetic pipeline, Multifunctional Arithmetic Pipelines, Superscalar Pipeline Design

(10 Hrs)

UNIT III

Parallel and Scalable Architectures: Multiprocessors and Multicomputers: Multiprocessor System Interconnects, Cache Coherence and Synchronization mechanisms, message passing mechanisms, Multivector and SIMD Computers: Vector Processing Principles, SIMD computer organization , Scalable, Multithreaded, and Dataflow Architectures

(10 Hrs)

UNIT IV

Software for Parallel Programming: Parallel Programming Models - Shared-Variable Model , message passing model, Data-Parallel Model , Object-Oriented Model, Functional and Logic Models, parallel languages and compilers, optimizing compilers for parallelism, Dependence Analysis of Data Arrays, Code Optimization and Scheduling, Loop Parallelization and Pipelining.

(10 Hrs)

Text Books:

1. Kai Hwang, Advanced Computer Architecture, Tata McGraw Hill Edition
2. Richard Y. Kain, Advanced Computer Architecture: a Systems Design, Prentice Hall
3. Quinn, Parallel Computing: Theory & Practice, TMH

References Books:

1.James M. Feldman, Charles T. Retter, Computer architecture: a designer's Text Based on a generic RISC, McGraw-Hill
2.Hennessy and Patterson, Computer Architecture: A Quantitative Approach, Elsevier.
3.Dezso and Sima, Advanced Computer Architecture, Pearson.

Paper Code: BCS-403 **L P C**

Paper Title: Mobile Computing **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT-I

Introduction: Mobile Computing, Motivations, concepts, and challenges of mobile computing, Architecture of Mobile Computing. Mobile computing environments, challenges and applications.Various Communication Radio Technologies, Security and Privacy issues. **(10 Hrs)**

UNIT-II

Wireless System and Standards: Cellular concept, frequency allocation. Global System for Mobile Communication GSM architecture and its interfacing, call routing in GSM, location management, HLRVLR, Mobility Management, Handoffs. Introduction to LAN Protocols. **(10 Hrs)**

UNIT-III

Data Management: Introduction, GPRS and Packet Data Network, GPRS Network architecture, operation and Data Services, Applications and Limitations of GPRS. **CDMA and 3G**: Introduction, Spread spectrum technology, CDMA versus GSM, 3G &4G Networks. Introduction to Dynamic routing algorithms **(10 Hrs)**

UNIT-IV

Emerging Technologies: Bluetooth technology, protocols and interfacing, Voice over IP and its Application. IPV6, Mobile IP. Location Based Services, Context aware Computing, data broadcasting and file management CODA file system. QoS issues in mobile Computing **(10 Hrs)**

Text Books:

1. Asoke K Telukder, Roopa R Yavagal, " Mobile Computing", TMH, 2011.
2. Raj Kamal, "Mobile Computing", Oxford University Press, 2007
3. Yi-Bing Lin & Imrich Chlamtac, "Wireless and Mobile Networks Architectures", John Wiley & Sons, 2001.

Reference Books:

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", Cambridge University Press, October 2004.
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden , Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", McGraw-Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", Springer, second edition, 2003.

Paper Code: BIT 401 **L P C**

Paper Title :Software Testing **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 60**

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT 1

Introduction: Testing Objectives, Software Testing Process, , Software Testing Principles, Tester Role in Software Development Organization, Test Case Implementation and Execution,. Testing Concepts: Levels of Testing, Test, Test Cases Design and Strategy, Test suit, Test Plan, Testing as a Process, Testing and Debugging, Limitations of Testing, Software, Testing Tools: Explain Manual and automatic testing, Tools: Static Testing Tools, Dynamic Testing Tools, Characteristics of Modern Tools, Process management tools,

(10 Hrs)

UNIT 2

Functional Testing: Boundary Value Analysis, Robustness Testing, Worst case testing, Special Value Testing, Equivalence Class Testing-Weak normal, Strong normal, weak robust and Strong Robust, Decision Table Based Testing, Cause Effect Graphing Technique.

Structural Testing: Control flow testing-Statement, Branch, Condition and Path coverage, Data Flow Testing-Identification of du and dc paths, testing strategies, Generation of test cases, Slice based testing- Mutation testing Integration Testing – Decomposition based Integration, Call Graph based Integration, System Testing: Thread Testing,

(**10Hrs)**

UNIT 3

Introduction to Object Oriented Testing State Based Testing, Class Testing: Object Oriented Testing, Web Testing, Issues in Object Oriented Testing. Regression Testing: Regression testing, selection of test cases, reducing the number of test cases, Prioritization guidelines, Priority Category. **(10Hrs)**

UNIT 4

Software Verification Methods, SRS Verification, SDD Verification, Source Code Reviews, Software Project Audit, Debugging: Debugging process and approaches Software Testing Metrics: Categories of Metrics, Metrics Used in Testing, Software Quality and Quality Models

(10Hrs)

Text Books:

1. Yogesh Singh, "Software Testing", Cambridge University Press, 2011
2. Paul C. Jorgensen, "Software Testing: A Craftsman's Approach", Auerbach Publications; 3rd Edition, 2013

References Books:

1. Ilene Burnstein, "Practical Software Testing: A Process-Oriented Approach", Springer, 2003.
2. Aditya P. Mathur, "Foundations of Software Testing", Prentice Hall 2008

Paper Code: BEC 401 **L P C**

Paper Title: Wireless Communication **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks :60**

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT I

Cellular Concepts - System Design Fundamentals: Cellular concept, Channel reuse, handoff strategies, dynamic resource allocation interference and system capacity, improving capacity and coverage of cellular systems.

Second and third generation network standards: GSM standardization, architecture and function Partitioning. GSM radio aspects, security aspects, protocol model, call flow sequences, evolution to 2.5G mobile radio networks, IS-95 service and radio aspects, key features of IS-95 CDMA systems- ECWDMA, UMTS physical layer, UMTS network architecture, CDMA 2000 physical layer. **(10Hrs)**

UNIT II

Radio Wave Propagation: Free space propagation model, basic propagation mechanisms– reflection, ground reflection model diffraction, scattering, practical link budget design, outdoor and indoor propagation models

Small scale fading and multipath: Small scale multipath propagation, Impulse response model of a mulitpath channel - small scale multipath measurements, parameters of mobile multipath channels, Types of small scale fading. **(10Hrs)**

UNIT III

Capacity of Wireless Channels: Capacity of Flat Fading Channel, Channel Distribution Information known, Channel Side Information at Receiver, Channel Side Information at Transmitter and Receiver, Capacity with Receiver diversity, Capacity comparisons, Capacity of Frequency Selective Fading channels.

Performance of digital modulation over wireless channels: Error probability of BPSK, FSK, MSK, GMSK, QPSK, M-ary PSK, M-ary QAM and M-ary FSK on AWGN channels, Fading, Outage Probability, Average Probability of Error, Combined Outage and Average Error Probability. (**10Hrs)**

UNIT IV

Performance Estimation and Evaluation: Estimation of Performance Measures, Estimation of SNR, Performance Measures for Digital Systems, Importance sampling method, Efficient Simulation using Importance Sampling, Quasi Analytical Estimation.

Next Generation Wireless Network: Evolution of Public Mobile Services, First Wave of Mobile Data Services: Text-Based Instant Messaging, Second Wave of Mobile Data Services: Low-Speed Mobile Internet Services, Current Wave of Mobile Data Services: High-Speed and Multimedia Mobile Internet Services. IP-Based Wireless Networks - 3GPP, 3GPP2.

(**10Hrs**

Text Books:

1. Andrea Goldsmith, "Wireless Communications," Cambridge University Press, 2010.
2. T.S. Rappaport, "Wireless Communications," Pearson Education, 2013.

3. William C.Y. Lee, “Wireless and Cellular Telecommunications,” Third edition, McGraw-Hill, 2006.

References Books :

1. S. Raj Pandya, “Mobile and Personal Communication Systems and Services,” Prentice Hall of India, 2002.
2. Raymond Steele, ed. “Mobile Radio Communications,” IEEE Press, New York, 1992.
3. V.K. Garg and J.E. Wilkes, “Wireless and personal Communication Systems,” PHI, 1996.
4. A.J. Viterbi, “CDMA: Principles of Spread Spectrum Communications,” Addison Wesley Wireless Communication Series, New York, 1995.

Paper Code: BIT 403 **L P C Paper**
Title: Big Data Analytics **4 0 0**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks**

Unit I

Introduction – RDBMS Overview, Challenges of Conventional Systems, Intelligent data analysis, Nature of Data, Analytic Processes and Tools, Analysis vs Reporting, Modern Data Analytic Tools, Statistical Concepts: Sampling Distributions, Re-Sampling, Statistical Inference, Prediction Error, Accuracy measures, Cutoff, Oversampling & Asymmetric Costs.
Big Data - Volume, Velocity, Variety, Veracity, types & sources of Big Data OLAP & RTAP.

(10 Hrs)

Unit II

Data Exploration & Dimension Reduction: Data Summaries, Data Visualization, Correlation Analysis, Reducing no of categories in Categorical variables, Principal Component Analysis for classification & prediction, Multiple Linear Regression, Transforming Data into Actionable Results.

(10 Hrs)

Unit III

Introduction to Ontology, Big Data Ontologies, Classification of Business data:- Naïve Bayes Classifier, K-Nearest Neighbour, Classification Tree, Discovering Association Rules in Transactional Databases. Clustering Techniques: Hierarchical and K-Means, Clustering of High Dimensional data – CLIQUE **(10 Hrs)**

Unit IV

Hadoop - The Hadoop Distributed File System – Components of Hadoop, Analyzing the Data with Hadoop, Map Reduce, Map Reduce Types and Formats, Map Reduce Features, NoSQL, Applications on Big Data Using Pig and Hive, Querying Data in Hive through HiveQL

(10 Hrs)

Text Books:

1. Chris Eaton, Dirk De Roos, Tom Deutsch, George Lapis, Paul Z., "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGraw Hill Publishing, 2011
2. Shmueli, Patel & Bruce, "Data Mining for Business Intelligence", 2nd Edition, Wiley Interscience Publications, 2010.

References Books

1. Jiawei Han, Micheline Kamber "Data Mining Concepts and Techniques", Second Edition, Elsevier, Reprinted 2008.
2. Michael Minelli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.
3. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.

4. Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2012.

Paper Code: BCS-407 **L P C**

Paper Title: Emerging trends in Computer Science &Engineering **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT-I

Grid Computing: Introduction to grid computing, architecture, its applications and case study. **Cloud Computing**: Evolution of Cloud Computing, Cloud Computing Reference Architecture - IaaS – On-demand Provisioning – Elasticity in Cloud – E.g. of IaaS Providers - PaaS – E.g. of PaaS Providers - SaaS – E.g. of SaaS Architectural Design of Compute and Storage Clouds . **(10 Hrs)**

UNIT-II

Big Data and Semantic webs: Introduction to BigData Platform – Challenges of Conventional Systems, Four V's of Big Data, Modern Data Analytic Tools, MapReduce – Hadoop, Hive, MapR – Sharding – NoSQL Databases - S3 - Hadoop Distributed File systems. Intelligent information and NLP techniques, introduction and applications of semantic webs. **(10 Hrs)**

UNIT-III

Social Media and Impact of Emerging Trends: Introduction of social media, Types of social media, Analysis of social media, Case Study (facebook, gmail, twitter, youtube) and their tools, Introduction of social network **(10 Hrs)**

UNIT-IV

Introduction to IOT (internet of things): Overview of IOT, IOE (Internet of everything) protocols, layered architecture, Tools and OS, Applications. **(10 Hrs)**

Text books :

1Asoke K Talukder, RoopaYavagal, Mobile computing -Technology, Applications, and Service Creation by McGraw-Hill

2. WH Inmon and Dan Linstedt Data Architecture: A Primer for the Data Scientist: Big Data, Data Warehouse and Data Vault

3 Internet of things, IBM Redbooks, 2013.

Reference Books:

1:Shambhu Upadhyaya, Abhijit Chaudhury, Kevin Kwiat, Mark Weiser, Mobile Computing: Implementing Pervasive Information and Communications Technologies, Volume 19, 2002 Springer.

2 Imielinski**,** Tomasz, Korth, Henry F. (Eds), Mobile Computing The Springer International Series in Engineering and Computer Science1996.

3 Jennifer Golbeck, Analyzing the Social Web, Elsevier Science & Technology, Mar 12, 2013.

Paper Code: BCS 409 **L P C**

Paper Title: Soft Computing **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 60**

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT I

Introduction of soft computing: soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing. Concept Of Uncertainty : Presence of uncertainty in real world problems, handling uncertain knowledge, degree of belief, degree of disbelief, uncertainty and rational decisions, decision theory, utility theory, concept of independent events, Bayes rule, Using Bayes rule for combining events.

(10 Hrs)

UNIT II

Rough Sets: Definition, Upper and Lower Approximations, Boundary Region, Decision Tables and Decision Algorithms. Properties of Rough Sets.

Fuzzy sets and fuzzy logic: Introduction to fuzzy logic, classical and fuzzy sets, overview of fuzzy sets, membership function, fuzzy rule generation, operations on fuzzy sets: compliment, intersection, union, combinations on operations, aggregation operation.

(10 Hrs)

UNIT III

Neural Networks :Overview of biological neurons, Mathematical model of Neuron, Perceptron and Multi Layer Perceptron, Learning in Artificial Neural Networks; Supervised, Unsupervised and Competitive Learning paradigms; Learning rules and Functions, Back propagation algorithm, RBF networks , Hopfield networks Associative Memories, Self Organizing Maps, Applications of Artificial Neural Networks

(10 Hrs)

UNIT IV

Nature Inspired Algorirms : Introduction, Evolutionary algorithms -Genetic Algorithm: History, terminology, biological background, creation of offspring, working principles of genetic algorithms, fitness function, Roulette wheel selection, Boltzmann selection, cross over mutation, inversion, deletion, and duplication, generation cycle , Swarm Optimization –Part Swarm Optimization and Ant Colony Optimization.

(10 Hrs)

Text Books:

1. Soft Computing, By Deepa Shivandan Das publication: John Wiley
2. Fuzzy & Neural and Genetic algorithm by Chandrasekharan, PHI
3. Fuzzy logic by John & Bays, T.J Ross, PHI publication

Reference Books

1.Fuzzy Logic: A spectrum of Theoretical and Practical issues, Paul P. Wang, pearson publication 2004.
2.Fuzzy Sets, Fuzzy logic, and Fuzzy Systems: Selected Papers- Lotfi Asker Zadeh, George J. Kilr, Bo yuan, 2005.
3.Foundations of Fuzzy logic and Soft Computing: 12th International Fuzzy conference proceeding, 2005.
4.Nature-Inspired Metaheuristic Algorithms: Second Edition , Xin-She Yang, Luniver Press, 2010

Paper Code: BCS-411 **L P C**

Paper Title: Introduction To E-Commerce and M-Commerce 4 0 4

INSTRUCTIONS TO PAPER SETTERS: Maximum Marks : 60

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.

2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks

UNIT 1

Electronic Commerce Introduction:- Definition of E- Commerce ,Electronic commerce and Physical Commerce, Architectural framework, Impact of E-commerce on business, different type of ecommerce, some e-commerce scenario, Economic potential of electronic commerce, Advantages and Disadvantages , Incentives for engaging in electronic commerce, forces behind E-Commerce. **(10Hrs)**

UNIT 2

E-business strategy: Introduction, Characteristics of e-Business, Business models, E-Business vs E-commerce, , e-business Requirements, impacts of ebusiness, Strategic positioning, Levels of e-business strategies, Strategic planning process, Success factors for implementation of e-business strategies, CRM, MRP. ERP:- Introduction, need of ERP, Modules of ERP
(10Hrs)

UNIT 3

Electronic Payment Methods: Overview, SET Protocol for credit card payment, E-cash, E-check, Micropayment system, Credit card, magnetic strip card,Smart cards, Electronics Data Interchange, ECommerce Law. Security Architecture, Encryption techniques, Symmetric & Asymmetric encryption, Digital Signatures, Virtual Private Network, IPsec, Threats, Firewalls.
(10Hrs)

UNIT-4

M-Commerce: Introduction, Attributes, customer and provider views, Architecture, Infrastructure of m-commerce, Requirement of the m-commerce, characteristics, Mobile Information device, Mobile Computing Applications, Mobile wallet,Mobile payments, Mobile portals, , Pros and Cons of m-commerce , Secure Transaction Processes: Wireless Application Protocol, Bluetooth, The role of emerging wireless LANs and 3G/4G wireless networks. **(10Hrs)**

Text Books:

1. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Addison Wesley.
2. Brian Mennecke and Troy Strader, "Mobile Commerce: Technology, Theory and Applications", Idea Group, 2003.
3. Dave Chaffey, "E-Business and E-Commerce Management", Third Edition, 2009, Pearson Education.

Reference Books:

1. E-Commerce Fundamentals and application (Henry Chan), 1st edition, 2001, Wiley publication
2. Bajaj and Nag, “E-Commerce the cutting edge of Business”, 2nd edition, 2005, TMH
3. P. Loshin, John Vacca, “Electronic commerce”, Firewall Media, 1st edition, 2005, New Delhi
4. “Enterprise resource Planning- Concepts and Practice”,V.K. Garg and N. K. Venkita Krishna, 1998, PHI.

Paper Code: BMA 417 **L P C**

Paper Title: Process Improvement Techniques **3 0 3**

INSTRUCTIONS TO PAPER SETTERS:	**MAXIMUM MARKS: 60**
1	**Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2	**Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks**

UNIT – I

Principles of Management: approaches to management thoughts, scientific management, functions of management **Organization:** Organization structure and organization design, The Process View of Organizations - Service and manufacturing processes – Nature of service processes, process structure in services, Process structure in Manufacturing , Value Chain – Core and support processes, adding value with processes. **(8Hrs)**

UNIT – II

Productivity, Value analysis and Value Engineering Concept, Procedure, Application and role in Productivity. **Process Improvement Techniques:** Total Quality Management(TQM), Basic Concept of Total Quality (TQ), Statistical Process Control, Programmes; Quality Improvement Teams; Marketing Aspect of T.Q.; Total Quality of Services; Total Quality and Safety; Six Sigma. **(7Hrs)**

UNIT – III

Benchmarking: Process and Benefits, Enterprise Resource Planning(ERP), Business Reengineering, Simulating business process – Application, simulation process, discrete event simulation, computer simulation. **(8Hrs)**

UNIT – IV

Constraint Management – theory of constraints, process layout – designing flexible flow layouts; Lean Systems – Toyota production system, characteristics of lean systems, continuous improvement, Kanban system Value stream mapping, JIT, Process Synchronization and Improvement. **(7Hrs)**

Text Books:

1. Manuel Laguna, Johan Marklund, "Business Process Modelling, Simulation and Design", Pearson Education, 2011.
2. Poornima M.Charantimath, "Total Quality Management", Pearson Education, First Indian Reprint 2003.
3. Shankar R., "Industrial Engineering and Management", Galgotia Publication, 2002.
4. Mathur, K and Solow D., "Management Science", Englewood Cliffs New Jersey, Prentice Hall Inc. 1994.

Reference Books:

1. Raví Anupindi, Sunil Chopra, Sudhakar Deshmukh,Jan A. Van Mieghem, and Eitan Zemel, "Managing Business Process Flows: Principles of Operations Management" Pearson Education, 2006

2. Douglas C. Montgomory, “Introduction to Statistical Quality Control”, Wiley Student Edition, Wiley India Pvt Limited, 2008.
3. James R. Evans and William M. Lindsay, “The Management and Control of Quality”, sixth Edition, Thomson, 2005.

Paper Code: BAS 419 **L P C**

Paper Title: Financial Accounting **3 0 3**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks**

UNIT – I

Introduction to Accounting, concept and objectives of accounting and bookkeeping, conventions and principles, Accounting Equation, International Accounting principles and standards, Matching of Indian Accounting Standards with International Accounting Standards, debit and credit entries, double entry principle, journal and journal entries; accounting of sole proprietorship. **(8Hrs)**

UNIT – II

Ledger posting and trial balance ,preparation of final accounts, Profit & Loss Account, Profit & Loss Appropriation account and Balance Sheet, Policies related with depreciation, inventory and intangible assets like copyright, trademark, patents and goodwill. **(7Hrs)**

UNIT - III

Analysis of financial statement: Ratio Analysis- solvency ratios, profitability ratios, activity ratios, liquidity ratios, Funds Flow Statement: Meaning, Concept of Gross and Net Working Capital, Preparation of Schedule of Changes in Working Capital, Preparation of Funds Flow Statement and its analysis. **(8Hrs)**

UNIT – IV

Cash Flow Statement: Various cash and non-cash transactions, flow of cash, preparation of Cash Flow Statement and its uses. **(7Hrs)**

Text Books

1. Maheshwari & Maheshwari, "An Introduction to Accountancy", Vikas Publishing House, 2009.
2. Maheshwari S.N., "Principles of Management Accounting", 11th Edition, Sultan Chand & Sons, 2001.
3. V.K. Gupta & R.L. Gupta, "Financial Accounting", Sultan Chand & Sons, 2014.
4. Ghosh T.P. "Financial Accounting for Managers", Taxman, 2009.

Reference Books:

1. Narayanswami, "Financial Accounting: A Managerial Perspective", PHI, 2014
2. Ramchandran & Kakani, " Financial Accounting for Management", TMH, 2011.
3 Ashish K. Bhattacharya, "Financial Accounting for Managers", PHI, New Delhi, 2006.

Paper Code: BAS 461 **L P C**

Paper: Disaster Management **0 2 1**

Objective: The course will focus on the areas of disaster management and preparedness, the relationship of different disaster management activities with mock drills and use of ICT for managing disaster.

Total Hrs: 20

UNIT I

Concepts and definitions of disaster - hazard, vulnerability, resilience, risks, Difference between accidents and disasters Categories of disasters -Natural disasters – earthquake, cyclone and hurricane, flood, tsunami, fire, Man-made disasters – technological, armed conflict and civil strife**,** Nuclear and gas leakage disasters, Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams. Strategic Planning for Disaster Preparedness, Recovery and Management of Disasters.

(12Hrs)

UNIT II

Technology disasters, Business Continuity Planning and Recovery, Disaster Policy of India (Salient Features). Use of ICT, mobile technology, alarms etc. for managing disaster.

(8Hrs)

Text books

1. Alexander David, Introduction in Confronting Catastrophe, Oxford University Press, 2000.
2. Kapur, Anu & others, Disasters in India Studies of grim reality, Rawat Publishers, Jaipur, 2005.
3. Gupta Anil K, Sreeja S. Nair. Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi, 2011

Reference Books

1. Andharia J. Vulnerability in Disaster Discourse, JTCDM, Tata Institute of Social Sciences Working Paper no. 8, 2008.
2. Govt. of India: Disaster Management Act 2005, Government of India, New Delhi

Paper Code: BCS-402 **L P C**

Paper Title: Embedded Systems Design **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT I

Introduction: Embedded system and general purpose computers, Embedded system components, Embedded System Design Process, Classification of an embedded system, Examples of an embedded system, Applications of an embedded system, Processor Selection for embedded systems and its issues, Embedded controllers, Memory selection, Programming language/tool selection, IDE selection. **(10 Hrs)**

UNIT II

Implementation Platforms and Its Programming: The ARM programmer's model, ARM development tools, ARM instruction set: Software interrupt (SWI) Interrupt Service Routines-Writing simple assembly language programs for ARM, 3-stage pipeline ARM organization Comparison between ARM and Atom processors. Introduction to Reconfigurable platforms (SoC, FPGA) **(10 Hrs)**

UNIT III

RTOS: Operating system service, RTOS architecture, Process management, Timer and Event function, Memory management, Device , File and I/O subsystem management, Interrupt routine in RTOS environment and handling of interrupt service calls, Watch dog timer, Real time clock, Customizing OS for Embedded system, Introduction to Embedded C. Case study of Mbed OS and RT Linux **(10 Hrs)**

UNIT IV

Advanced Processors for Embedded Systems: Intel architecture for Embedded System and IoT (Intel Atom architecture, Intel Galileo) Interfacing, Programming of Peripherals such as LCD ,Sensors (Temperature, Humidity, PIR etc), Buzzer and Bluetooth . Introduction to H/W and S/W co-design. **(10 Hrs)**

Text Books:-

1. William Hohl, ARM Assembly Language: Fundamentals and Techniques, CRC Press, Second Edition.
2. Steve Heath, Embedded Systems Design, Newnes(Elsevier) publications ,Second Edition,
3. Manoel Ramon, Intel Galileo Gen 2 and Intel Edison for Beginners: A Hands-on Introduction, A press Open

Reference Books:

1. Dr.K.V.K.K.Prasad, Embedded/Real Time Systems: Concepts, Design and Programming, Dream Tech press, Black Book, 2005.
2. Wayne Wolf, Computer as Components: Principles of Embedded Computer System Design Princeton University.
3. Arnold S. Berger, Embedded System Design: An introduction to Processes Tools and Techniques, Viva CMP Books.

Paper Code: BIT 404 **L P C**

Paper: Cyber Security and Management **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks: 60**

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks**

UNIT - I

Importance of Information Protection, The evolution of Information Security, Justifying Security Investment, Security Methodology, Building Security Program, Security Goals, Services and Mechanism, Attributes of Information Security, Confidentiality, Integrity, Authentication, Availability and Non repudiation, Secure Design Principles, Defence Models, The Lollipop Model, The Onion Model,

(10 Hrs)

UNIT – II

Cryptography Basics, Symmetric Vs asymmetric Cryptography, Key Management, Public Key Cryptography and Applications: RSA, Elliptic Curve Cryptography, Message Authentication Code, Message Digest, Properties of Message Authentication Code, Hash Function, Properties of Hash Function, Secured Hash Algorithm, Digital Signatures, Digital Signature Standard

(10 Hrs)

UNIT - III

Fundamentals of Computer Forensics, Computer Forensics Technology, Live data collection from Windows systems, Live data Collection from Unix systems, Data Acquisition of digital evidence from electronic media, Evidence collection and preservation, Network Forensics, Email Investigations, Mobile device forensics, Computer Forensics Analysis and Validation, Incident Report preparation**.**

(10 Hrs)

UNIT - IV

Risk Analysis **:** Threat Definition, Threat Vectors, Threat Sources and Targets, Types of Attacks, Malicious Mobile Codes, Advance Persistent Threats, Manual Attacks, Risk Analysis, Compliance with standard regulation and laws, Information Security Standards, COBIT, ISO 27000 series, NIST, Vulnerabilities, Cyber laws, Indian IT Act, Case study: Recent security attacks in critical information infrastructures and its management.

(10 Hrs)

Text Books:

1. Mark Rhodes, "The complete reference Information security", 2nd Edition, McGraw Hill, 2013.
2. William Stallings, "Cryptography and Network security Principles and Practices", 6th Edition, Pearson Education, 2013.

Reference Books

1. B A Forouzan, Debdeep Mukhopadhyay, " Cryptography and Network Security", 2nd Edition, McGraw Hill Education, 2010
2. Matt Bishop, "Computer Security: Art and Science", 1st Edition, 2002, Addison Wesley.

Paper Code: BCS 406 **L P C**

Paper Title: Real Time Systems **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 60**

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT-I

Introduction to Real-time Systems: Introduction, Characterizing real time systems and tasks, Embedded systems, Hard Versus Soft Real-Time Systems, Typical Real-Time Applications, Reference Model of Real-Time Systems, Modeling Timing constraints **(10 Hrs)**

UNIT-II

RTOS: Scheduling Real-Time Tasks- Types of Schedulers, Table-driven scheduling, Cyclic schedulers, EDF, RMA, Clock-Driven Scheduling, Priority-Driven Scheduling of Periodic Tasks, Scheduling Aperiodic and Sporadic Jobs in Priority-Driven Systems **(10 Hrs)**

UNIT-III

Real-time Communication: Handling Resource sharing among real-time tasks, Scheduling Real-Time Tasks in Multiprocessor and distributed systems, Commercial Real-time operating systems: Case study of commercial RTOS[VxWorks, RT Linux] **(10 Hrs)**

UNIT-IV

Issues in Real-time Systems : Real-Time Communication- network topologies, protocols., Real-Time Databases – Real time vs general purpose databases, main memory databases, Concurrency control issues, databases for hard real time systems, fault tolerance techniques – reliability. Emerging trends in real-time system(IoT, Pervasive Competing, distributed systems) **(10 Hrs)**

Text Books:

1. Rajib Mall, Real-Time Systems: Theory and Practice, Pearson, 2008

2. Krishna and Shin, Real-Time Systems, Tata McGraw Hill. 1999.

3. Jane W. Liu, Real-Time Systems, Pearson Education, 2001.

Reference Books:

1. Alan C. Shaw, Real-Time Systems and Software, Wiley,2001.

2. Philip Laplante, Real-Time Systems Design and Analysis, 2nd Edition, Prentice Hall of India.

3. Seyed Morteza Babamir, Real-Time Systems, Architecture, Scheduling, and Application, IN-TECH (April , 2012).

Paper Code: BIT 408 **L P C**

Paper Title: Natural Language Processing **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT – I

Introduction to NLP: General Characteristics of Natural language, Brief history and Challenges: ambiguity, incompleteness, imprecision, Language structure, NLP tasks in syntax, semantics and pragmatics, Machine Learning and NLP.

Word and Word Forms: Regular Expressions, Morphology, and Finite State Transducers, Word class and POS Tagging, Shallow Parsing, Introduction to Phonology. **(10 Hrs)**

UNIT – II

Grammars and Parsing: Grammars and sentence structure, Overview of CFG, Parsing with Context-Free Grammars, Lexicalized and Probabilistic Parsing, Brief Introduction to Semantics & Pragmatics, Lexical semantics. **(10 Hrs)**

UNIT- III

Machine Translation: Introduction, Challenges in Machine Translation, Classical Approaches to machine Translation, Introduction to Statistical Machine Translation, Introduction to IBM Models 1 and 2, N-Grams and Language Models, Markov Process, Tri-Gram Language Models, Evaluation of Machine Translation. **(10 Hrs)**

UNIT-IV

Statistical Techniques: Elementary Probability theory, Essential information theory, Hidden Markov Model, Expectation Maximization.

Applications of Statistical Techniques: POS Tagging, Named Entity Recognition and Word SenseDisambiguation**.** **(10 Hrs)**

Text books-

1. Jurafsky, Dan and Martin, James, Speech and Language Processing, Second Edition, Prentice Hall, 2008
2. Akshar Bhartati, Sangal and Chaitanya, Natural language processing , Eastern Economy Edition, PHI, New Delhi, 1996.

Reference Books

1. P.Syal and D.V.Jindal, an introduction to Linguistics: language grammar and semantics, Eastern Economy Edition, PHI, 2007.
2. Allen, James, Natural Language Understanding, Second Edition, Benjamin/Cumming, 1995.
3. Philipp Koehn, Statistical Machine Translation, Cambridge University Press.

Paper Code: BCS-410 **L P C**

Paper Title: Advanced DBMS **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 60**

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT-I

Introduction: DBMS Architecture and Components, Relational Model and its difficulties, Advantages and Disadvantages; Data models: ER, EER, Network, Hierarchical and Relational data models; Normalization and de-normalization, Object Oriented Databases, Need for complex data types, Object Relational Systems **(10 Hrs)**

UNIT-II

Query Processing: General strategies for query processing, query processor, syntax analyzer, Query decomposition, Heuristic Query optimization, Cost estimation., Selection Operation, Sorting, Join operation, evaluation of expressions, Query Optimization, estimating statistics of expression results, transformation of Relational Expressions, Choice of evaluation plans, Materialized Views. (**10 Hrs)**

UNIT-III

Distributed Databases: Basic concepts, architectures, parallelization of operations, Methods for data distribution: fragmentation and replication, **Distributed Databases**: Homogeneous & Heterogeneous Databases, Distributed Data Storage, Distributed Transactions and their commit protocols, Concurrency Control in Distributed Databases, Distributed Query Processing, Decision Support Systems. (**10 Hrs)**

UNIT-IV

Databases for Advanced Applications: Data warehouse Vs. DBMS, architecture, Data mining systems, KDD process,Web databases, Information retrieval and XML.Knowledge-based approaches, Conceptual Graphs, Applications, Information Extraction, Automatic Text Summarization Systems, and Question Answering Systems. Emerging Issues in Databases

(10 Hrs)

Textbooks :

1. Silberchatz, Korth, Sudershan, Data base System Concepts, Tata MC Graw Hills Publishing. , 5th Edition, 2005

2. Raghu Ramakrishnan, J.Gerkhe, Database Management Systems, Tata MC Graw Hill Publications. 3rd Edition, 2003

3. G.J. Kowalski, M.T. Maybury, Information Storage & Retrieval Systems :- Theory & Implementation 1st edition,2000

References :

1. D.A Grossman, O.Frieder, Information Retrieval, Springer Publication. 2nd edition, 2004

2. Bipin C. Dcsai, An Introduction to database systems, Galgolia Publications.

3. S.K. Singh, Database systems : concepts, design and applications, Pearson education, 2009

Paper Code: BCS-412 **L P C**

Paper Title : Wireless Sensor Networks **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 60**

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT I

Introduction: Mobile Ad-hoc Networks (MANETs), Introduction to Sensor Networks, Constraints and Challenges, Advantage of Sensor Networks, Applications of Sensor Networks.
Architecture: Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes, Operating Systems, Network Architecture -Sensor Network Scenarios, Optimization Goals, Gateway Concepts. **(10 Hrs)**

UNIT II

Networking Sensors: Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor Networks, classification of MAC protocols, MAC protocols for sensor network, location discovery, S-MAC, IEEE 802.15.4. Routing Protocols- Energy-Efficient Routing, Geographic Routing. **(10 Hrs)**

UNIT III

Infrastructure Establishment: Topology Control, Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control. Case study of WSN's for different applications. **(10 Hrs)**

UNIT IV

Platform, Tool and Security: Sensor Node Hardware – Berkeley Motes, Programming Challenges, Node-level software platforms, Node-level Simulators. Security issues in Sensor Networks. Future Research Direction. **(10 Hrs)**

Text Books

1.Holger Karl & Andreas Willig, Protocols And Architectures for Wireless Sensor Networks , John Wiley, 2005.
2.Feng Zhao & Leonidas J. Guibas, Wireless Sensor Networks- An Information Processing Approach, Elsevier, 2007.
3.C.Siva Ram Murthy and B.S.Manoj, Ad hoc Wireless Networks Architectures and Protocols, Pearson Education,. 2nd edition

Reference Books

1.Dr.Xerenium, Shen, Dr. Yi Pan , Fundamentals of Wireless Sensor Networks, Theory and Practice,
2.Wiley Series on wireless Communication and Mobile Computing, 1st Edition, 2010.
3.KazemSohraby, Daniel Minoli, &TaiebZnati, Wireless Sensor Networks- Technology, Protocols, And Applications, John Wiley, 2007.
4.BhaskarKrishnamachari , Networking Wireless Sensors, Cambridge university press, 2005.
Anna Hac, Wireless Sensor Network Designs, John Wiley, 2003.

Paper Code: BIT-414 **L P C**

Paper: IPR and Cyber Laws **4 0 4**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

1. **Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.**
2. **Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 10 marks.**

UNIT 1

Introduction and need for Intellectual Property Right (IPR), Types of IPR, Legislation covering IPRS in India, Patent and kind of inventions protected by a patent. Understanding cyber laws, Scope of cyber laws, Need for cyber laws, law and legal system, Jurisprudence of Indian cyber law, Security threat to cyber space and e-commerce, Evolution of Cyber Crime.

(10 Hrs)

UNIT 2

Introduction to geographical indications, New plant varieties, Unfair competitions, Plant Breeder and TRIPS agreement. Copy rights, Rights covered by copyright, Protection of copyright, Trademarks, Rights of trademark, Signs used in trademarks, Types of trademark function, Protection of trademark, Registration of trademark, Domain name and how does it relate to trademarks, Cases related to IPR infringement.

(10 Hrs)

UNIT 3

Components of cyber laws in India - Information Technology Act and its amendment; Introduction of relevant provisions from Indian Penal Code, Indian Evidence Act, Bankers Book Evidence Act, Reserve Bank of India Act, etc. related to cyber security. Obscenity and pornography on Cyber space, Hacking, Punishment for violation of privacy under IT Act, Ministerial order on blocking of websites, Cyber laws in US, Cyber laws in global prospective, MLAT (Mutual Legal Assistance Treaty) international treaty for cyber laws.

(10 Hrs)

UNIT 4

Information Technology Act – a brief overview; Documents or transactions to which IT Act shall not be applicable; Meaning of computer, Computer system and Computer network. Protection of intellectual property rights in Cyber spaces in India, Plagiarism issues.

(10 Hrs)

Text Books:

1. B.L. Wadhera, "Law Relating to Intellectual Property", 5th Edition, Universal law publishing,2013
2. Harish Chander, " Cyber Laws and IT Protection", 1st edition, PHI, 2012

Reference Books:

1. Prof. Vimlendu Tayal "Cyber Law Cyber Crime Internet and E Commerce", Bharat Law Publications,2011

Paper Code: BAS 420 **L P C**

Paper Title: Business Entrepreneurship **3 0 3**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

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UNIT – I

Introduction: The entrepreneur, definition, **characteristics;** leadership, risk taking, decision making and business planning, role of entrepreneur, entrepreneurship and an entrepreneurial perspective, significance of entrepreneurship, Innovation and entrepreneur, entrepreneurial behaviour and psycho-theories, social responsibility. **(8Hrs)**

UNIT – II

Promotion of a Venture: Opportunities analysis; external environmental analysis, economic, social and technological, competitive factors, fundamentals of feasibility plan, forms of business enterprises, Sole proprietorship, partnership and corporations, legal requirements of establishment of a new unit. **(7Hrs)**

UNIT – III

Financial resources, rising of funds and documentation required. Project financing: fixed and working capital requirements, equity financing, securities market, venture capital, debt financing, banks and financial institutions and other non-bank financial sources, Government programmes, direct loan assistance and subsidies. **(8Hrs)**

UNIT – IV

Managing growth and transition: the organization life cycle; The entrepreneur-s perspective, changing roles. Entrepreneurial Development Programmes (EDP): EDP, their role, relevance and achievements; role of government in organizing EDP's critical evaluation**.** **(7Hrs)**

Text Books

1. Vasant, DCSAI, "Entrepreneurship", Himalaya Publishing House, 2003.

2. Ram Chandran, 'Entrepreneurial Development', Tata McGraw Hill, New Delhi, 2008

3. Pandey I.M.; "Venture Capital –The Indian Experience", Prentice Hall of India, 2003.

4. Panda, Shiba Charan, " Entrepreneurship Development", Anmol Publications New Delhi, 2014.

Reference Books:

1. Srivastava S.B. " A practical guide to industrial entrepreneurs", Sultan Chand & Sons, New Delhi, 1992.

2. Chandra, Prasana, "Project Preparation, Appraisal, Implementation", TMH, New Delhi, 2002.

3. Holt, David H., "Entrepreneurship: New Venture Creation", Prentice-Hall of India, New Delhi, 1992

Paper Code: BAS 422 **L P C**

Paper Title: Organizational Behaviour **3 0 3**

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 60

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UNIT – I

Introduction to Management and Organizational Behaviour: Introduction- Meaning and Nature of Management, Management Functions and Processes. Scientific Management Theories ; Taylor and Scientific Management; Evolution of Organizational Behaviour- Classical, Neo Classical and Modern Approaches, Contemporary School of Management Thoughts, Theories of Organization. **(8Hrs)**

UNIT – II

The Individual Behaviour- Factors affecting Individual Behaviour, Personality, Learning Process, Motivational Process, Perceptual Process, Attitudes and Values. **Group Behaviour:** Groups- Definition, Types, Theories of Group formation, Group Roles and Norms, Interpersonal relations, Group Dynamics, Leadership Styles & Leadership Development **(7Hrs)**

UNIT – III

Behaviour in the organization: Introduction, Issues between organizations and individuals. Interpersonal behaviour: Conflict in Organizations: nature of conflict, levels of conflict, conflict management styles. Management of Organizational Conflicts. Employee stress: forms, causes, implications, approaches to stress management. **(8Hrs)**

UNIT – IV

Organizational structure & Design, Organizational Designs; Emerging Design Options Different Organizational Structures; Communication Process, Organizational Culture (creation and sustenance of cultures) , Organizational Ethos, Dimensions of Culture, Model for Managing Change, Forces for Change, resistance to change, Management of resistance. **(7Hrs)**

Text books:

1. Stephen P. Robinson: Organisational Behaviour, 11th edition, New Delhi – 110001 Prentice – Hill of India Pvt. Ltd., 2007.
2. L.M.Prasad: Organizational Behaviour, New Delhi, Sultan Chand & Sons, 2001.
3. Udai Pareek, "Understanding Organizational Behavior", 1st Ed, Oxford University Press., 2004.
4. Robbins, S. P., Judge, T. A. and Sanghi. S, "Organizational Behavior", Pearson, 2009.

REFERENCES:

1. Stoner, et. al., "Management", PHI, 6th Ed., 2002.
2. J. S. Chandan, "Organizational Behaviour", Vikas Publishing House, 2004.
3. Joseph W. Weiss, "Organizational Behaviour & Change, Managing Diversity, Cross-Cultural Dynamics & Ethics", Vikas Publishing House, 2nd Ed. 2001.
4. Jit S Chandan: Organisational Behaviour, 3rd edition, 576, Masjid Road, Jangpura, N.D., New Delhi-1100014, Vikas Publishing House Pvt. Ltd., 2006.
5. Fred Luthans, "Organizational Behaviour," McGraw Hill International Edition, 9th Ed., 2002.
6. Kavita Singh, "Organization Behaviour Text and Cases", Pearson, 2010.

Paper Code: BIT 403
Paper Title: Big Data Analytics

L	P	C
4	0	4

INSTRUCTIONS TO PAPER SETTERS:

1 Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.

2 Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks

Unit I

Introduction – RDBMS Overview, Challenges of Conventional Systems, Intelligent Data Analysis, Nature of Data, Analytic Processes and Tools, Analysis vs Reporting, Modern Data Analytic Tools, Statistical Concepts: Sampling Distributions, Re-Sampling, Statistical Inference, Prediction Error, Accuracy measures, Cutoff, Oversampling & Asymmetric Costs. Big Data - Volume, Velocity, Variety, Veracity, types & sources of Big Data OLAP & RTAP. (10 Hrs)

Unit II

Data Exploration & Dimension Reduction: Data Summaries, Data Visualization, Correlation Analysis, Reducing no of categories in Categorical variables, Principal Component Analysis for Classification & Prediction, Multi Variate Regression Analysis, Bayesian Modeling, Support Vector Method, Time Series Analysis. (10 Hrs)

Unit III

Introduction to Streams Concepts, Stream Data Model and Architecture, Stream Computing, Sampling Data in a Stream, Filtering Streams, Counting Distinct Elements in a Stream, Case Study: Real Time Sentiment Analysis/Stock Market Prediction. (10 Hrs)

Unit IV

Hadoop - The Hadoop Distributed File System – Components of Hadoop, Analyzing the Data with Hadoop, Map Reduce, Map Reduce Types and Formats, Map Reduce Features, NoSQL Database.

Applications on Big Data Using Pig and Hive, Querying Data in Hive through HiveQL (10 Hrs)

TEXT BOOKS

1. Chris Eaton, Dirk De Roos, Tom Deutsch, George Lapis, Paul Z., "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGraw Hill Publishing, 2011

2. Shmueli, Patel & Bruce, "Data Mining for Business Intelligence", 2nd Edition, Wiley Interscience Publications, 2010.

REFERENCE BOOKS

1. Jiawei Han, Micheline Kamber "Data Mining Concepts and Techniques", Second Edition, Elsevier, Reprinted 2008.

2. Michael Minelli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.

3. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.

4. Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2012.