Krantiguru Shyamji Krishna Verma Kachchh University, Bhuj
Master of Science (Computer Applications & Information Technology)
Semester: VIII

Paper Code: CCCS831		**Total Credit :** 4
Title of Paper: Advanced Java Programming		**Total Marks :** 70 **Time :** 3 Hrs
Unit	**Description**	**Weighting**
I	Introduction to J2EE Platform and Architecture The J2EE Platform, The J2EE Architecture Containers, J2EE Technologies, Developing J2EE Applications, Introducing Java Mail and JMS	**20%**
II	Database Programming ODBC and JDBC Drivers, Connecting to Database with the java.sql Package, Using JDBC	**20%**
III	*Servlets* Introduction to Servlets and architecture , Servlet Life Cycle, Servlet based Applications, type of servlet, Servlet and HTML, Session management *JSP* Introduction to JSP, JSP implicit objects, JSP based Applications, Session Management	**20%**
IV	*Remote Method Invocation (RMI)* The RMI Architecture, RMI Exceptions Developing Applications With RMI, Parameter Passing in RMI *XML* XML syntax and semantics, Writing Document Type Definitions (DTDs), XML based applications	**20%**
V	*Java Beans* An overview of Java Beans Requirement, Development and Scope of Java Beans Design consideration and Naming conventions of Java Beans and Guideline. *Enterprise Java Beans (EJB)* Introduction to EJB Entity Beans Session Beans	**20%**
Basic Text & Reference Books :-		
1.	Professional Java Server Programming by Subrahmanyam Allamaraju	
2.	J2EE Bible by Justin Couch and Deniel H. Steinberg	
3.	Professional Java Server Programming Volume I and II, Wrox Publication.	
4.	J2EE Unleashed by Joseph J. Bambara, BPB publications	
5.	Enterprise JAVA J2EE 1.3 complete, BPB publications	

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Paper Code: CCCS831			**Total Credit :** 4 **Total Marks :** 70 **Time :** 3 Hrs
Title of Paper: Advanced Java Programming			
Unit	**Description**		**Total Marks**
I	Q.1 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.1 (B) Medium / Long Questions. (With Internal Option)	08	
II	Q.2 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.2 (B) Medium / Long Questions. (With Internal Option)	08	
III	Q.3 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.3 (B) Medium / Long Questions. (With Internal Option)	08	
IV	Q.4 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.4 (B) Programs. (With Internal Option)	08	
V	Q.5 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.5 (B) Programs. (With Internal Option)	08	

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Paper Code: CCCS832		**Total Credit :** 4
Title of Paper: Cryptography		**Total Marks :** 70 **Time :** 3 Hrs
Unit	**Description**	**Weighting**
I	**Introduction** Security Trends, OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, History and Overview of Cryptology	**20%**
II	**Symmetric Ciphers** Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines / Enigma, Steganography Block Ciphers: Principles, Data Encryption Standard/ 3DES, DES Operation, DES Strength, Block Cipher Design Principles	**20%**
III	**Asymmetric Ciphers** Prime Numbers, Principles of Public Key Cryptosystems, The RSA Algorithm, Diffie-Hellman Key Exchange, Pseudorandom Number Generation, Cryptographic Hash Functions, Secure Hash Algorithm, Message Authentication Codes, Digital Signatures	**20%**
IV	**Network and Internet Security** Key Distribution, X.509 Certificates, Public Key Infrastructure, Web Security Issues, Secure Sockets Layer (SSL), Transport Layer Security (TLS), HTTPS, Secure Shell (SSH), Wireless Network Security Overview, Email Security: PGP, S/MIME, DKIM.	**20%**
V	**Scams and Cyber Laws** DoS and DDoS attacks, CAPTCHA, Spam, Phishing, Ponzi Schemes, Indian IT Act 2000 with Subsequent Amendments.	**20%**
Basic Text & Reference Books :-		
1.	Cryptography and Network Security, William Stallings, Pearson	

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Paper Code: CCCS832			**Total Credit :** 4 **Total Marks :** 70 **Time :** 3 Hrs
Title of Paper: Cryptography			
Unit	**Description**		**Total Marks**
I	Q.1 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.1 (B) Medium / Long Questions. (With Internal Option)	08	
II	Q.2 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.2 (B) Medium / Long Questions. (With Internal Option)	08	
III	Q.3 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.3 (B) Medium / Long Questions. (With Internal Option)	08	
IV	Q.4 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.4 (B) Medium / Long Questions. (With Internal Option)	08	
V	Q.5 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.5 (B) Medium / Long Questions. (With Internal Option)	08	

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Semester: VIII

Paper Code: CCCS833	**Total Credit :** 4
Title of Paper: Artificial Intelligence	**Total Marks :** 70 **Time :** 3 Hrs

Unit	Description	Weighting
I	**Artificial Intelligence and Knowledge-Based Systems** Natural and Artificial Intelligence – Characteristics and Definitions of AI AI based systems, Testing the Intelligence with Turing Test, and Chinese Room Experiment, Application Areas of Artificial Intelligence, Data Pyramid and Computer Based Systems Production Systems and AI based Searches like Hill Climbing and Heuristic Search Introduction & Objectives of KBS, Components of KBS Categories of the KBS like Expert Systems, Database Management Systems in Conjunction with an Intelligent User Interface, Linked Systems, CASE Based Systems, Intelligent Tutoring Systems, etc. Issues and limitations of KBS General structure of KBS, Conflict Resolution Strategies for Rule Based Systems Knowledge Base Shell Advantages, limitations and applications of Knowledge-Based Systems	**20%**
II	**Development of Knowledge-Based Systems** Development of Knowledge-Based System, Difficulties in KBS Development Knowledge-Based Systems Development Model, Knowledge Acquisition Process and Techniques, Knowledge Sharing, Dealing with Multiple Experts, Issues in Knowledge Acquisition, Knowledge Update Characteristics of Good Knowledge Representation Scheme Factual and Procedural Knowledge Representation Applications and Users of KBS Tools for KBS development and Case Studies	**20%**
III	**Fuzzy Logic** Introduction to fuzzy logic Fuzzy logic and fuzzy sets, Membership Functions, Fuzzification and Defuzzification, Operations on Fuzzy Sets Fuzzy Functions and Linguistic Variables Fuzzy Relationships, Propositions and Connectives Fuzzy Inference Fuzzy Rules, Fuzzy Control System and Fuzzy Rule Based Systems	**20%**
IV	**Neural Network** Neural Networks: Introduction, Advantages and Disadvantages of Neural Networks Biological Neuron and Artificial Neuron Neural Network Architectures Applications of Neural Network	**20%**
V	**Genetic Algorithm** Introduction to Genetic Algorithm Basic Terminology, Genetic Algorithm, GA Cycle Basic Operator of GA, Function Optimization Introduction to Prolog Prolog Application and Programs	**20%**

Basic Text & Reference Books :-

1.	Elain Rich: “Artificial Intelligence”, McGraw Hill, Third Edition, 2001.
2.	R. Akerkar: “Introduction to Artificial Intelligence”, Prentice Hall of India, 2005.
3.	R. Akerker and P. S. Sajja: “Knowledge-Based Systems”, Jones and Bartlettes, MIT, 2010

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Semester: VIII

Paper Code: CCCS833			**Total Credit :** 4 **Total Marks :** 70 **Time :** 3 Hrs
Title of Paper: Artificial Intelligence			
Unit	**Description**		**Total Marks**
I	Q.1 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.1 (B) Medium / Long Questions. (With Internal Option)	08	
II	Q.2 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.2 (B) Medium / Long Questions. (With Internal Option)	08	
III	Q.3 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.3 (B) Medium / Long Questions. (With Internal Option)	08	
IV	Q.4 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.4 (B) Medium / Long Questions. (With Internal Option)	08	
V	Q.5 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.5 (B) Prolog Programs. (With Internal Option)	08	

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Paper Code: CCCS834	**Total Credit :** 4
Title of Paper: Practical Based on CCCS834	**Total Marks :** 70 **Time :** 3 Hrs

Description

1. Understanding J2EE Architecture
2. Demonstration of JDBC connectivity.
3. Understanding Java Mail and JMS.
4. Understanding Servlet Architecture
5. Understanding JSP and JSP objects
6. Demonstration of Session Management
7. Understanding RMI Architecture
8. Understanding RMI with XML.
9. Demonstration of XML based applications
10. Understating EJB

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Time : 3 Hrs</td></tr>
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<tr><td>Unit</td><td colspan="2">Description</td><td>Total Marks</td></tr>
<tr><td rowspan="2">I</td><td>Q.1 (A) Viva – Voce</td><td>20</td><td rowspan="2">70</td></tr>
<tr><td>Q.1 (B) Practical</td><td>50</td></tr>
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Paper Code: CCCS835	**Total Credit :** 4
Title of Paper: Practical Based on CCCS833 and Elective Courses	**Total Marks :** 70 **Time :** 3 Hrs
Description	
1. Understanding Turbo Prolog: Installing, Running Programs, Saving and Loading Files 2. Understanding Prolog Syntax and Semantics. 3. Understanding Branching. 4. Understanding Looping. 5. Understanding Functions and Parameters. 6. Understanding List 7. Understanding various objects. 8. Understanding Recursion.	

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Paper Code: CECS816	**Total Credit :** 4
Title of Paper: Embedded Systems	**Total Marks :** 70 **Time :** 3 Hrs

Unit	Description	Weighting
I	**Introduction** What is IoT?, Examples of IoT, Appliances, Smart Health care, Oil & Gas Industry, Smart Places, IoT v/s Computer v/s Smartphone, Adoption and trends in IoT, Social benefits of IoT, Risk-Security-Privacy of IoT. Embedded Systems: An introduction to embedded systems, examples, generic structure of embedded system, sensors and actuators, Analog / Digital Conversion, basic devices.	**20%**
II	**Arduino Basics** IDE, Setting up Arduino Board, Arduino Sketch, Uploading and Running Blink Sketch, Creating and Saving Sketch, Structure of Sketch, Primitive Types, Functional Blocks, Conditions, Loops, Operators.	**20%**
III	**Arduino Communications** Sending Debug Information from Arduino to Your Computer, Sending Formatted Text and Numeric Data from Arduino, Receiving Serial Data in Arduino, Sending Multiple Text Fields from Arduino in a Single Message, Receiving Multiple Text Fields in a Single Message in Arduino, Sending Binary Data from Arduino, Receiving Binary Data from Arduino on a Computer, Sending Binary Values from Processing to Arduino, Sending the Value of Multiple Arduino Pins, How to Move the Mouse Cursor on a PC or Mac, Controlling Google Earth Using Arduino, Logging Arduino Data to a File on Your Computer, Sending Data to Two Serial Devices at the Same Time, Receiving Serial Data from Two Devices at the Same Time, Setting Up Processing on Your Computer to Send and Receive Serial Data.	**20%**
IV	**Input** Using a Switch, Using a Switch Without External Resistors, Reliably Detecting the Closing of a Switch, Determining How Long a Switch Is Pressed, Reading a Keypad, Reading Analog Values, Changing the Range of Values, Reading More Than Six Analog Inputs, Displaying Voltages Up to 5V, Responding to Changes in Voltage, Measuring Voltages More Than 5V (Voltage Dividers) Detecting Movement, Detecting Light, Detecting Motion (Integrating Passive Infrared Detectors), Measuring Distance, Measuring Distance Accurately, Detecting Vibration, Detecting Sound, Measuring Temperature, Reading RFID Tags, Tracking Rotary Movement, Using a Mouse, Getting Location from a GPS	**20%**
V	**Introduction to Raspberry Pi** A Tour of the Boards, The Proper Peripherals, The Case, Flash the SD Card, Booting Up, Configuring Your Pi, Shutting Down, Troubleshooting **Linux on the Raspberry Pi** Using the Command Line, Files and the Filesystem, More Linux Commands, Processes, Sudo and Permissions, The Network, /etc, Setting the Date and Time, Installing New Software, Python on Raspberry Pi **Programming Inputs and Outputs with Python** Installing and Testing GPIO in Python, Blinking an LED, Reading a Button **Working with Webcams** Testing Webcams, Installing and Testing SimpleCV, Displaying an Image.	**20%**

Basic Text & Reference Books :-

1. Arduino Cookbook, Michael Margolis, O'Reilly
2. Getting Started with Raspberry Pi, Matt Richardson, O'Reilly

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Paper Code: CECS816			**Total Credit :** 4 **Total Marks :** 70 **Time :** 3 Hrs
Title of Paper: Embedded Systems			
Unit	**Description**		**Total Marks**
I	Q.1 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.1 (B) Medium / Long Questions. (With Internal Option)	08	
II	Q.2 (A) Answer the Following. (Definitions, Blanks, Full Forms, True/False, Match the Following)	06	14
	Q.2 (B) Medium / Long Questions. (With Internal Option)	08	
III	Q.3 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.3 (B) Medium / Long Questions. (With Internal Option)	08	
IV	Q.4 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.4 (B) Medium / Long Questions. (With Internal Option)	08	
V	Q.5 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.5 (B) Medium / Long Questions. (With Internal Option)	08	

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Paper Code: CECS817		**Total Credit :** 4
Title of Paper: Optimization Techniques		**Total Marks :** 70 **Time :** 3 Hrs
Unit	**Description**	**Weighting**
I	**Linear Programming Model** Mathematical Formulation Graphical Solution of linear programming models Simplex method Artificial variable Techniques- Variants of Simplex method	**20%**
II	**Transportation and Assignment Model** Mathematical formulation of transportation problem Methods for finding initial basic feasible solution optimum solution Degeneracy Mathematical formulation of assignment models Hungarian Algorithm Variants of the Assignment problem	**20%**
III	**Integer Programming Model** Formulation – Gomory's IPP method – Gomory's mixed integer method – Branch and bound technique.	**20%**
IV	**Scheduling by PERT and CPM** Network Construction – Critical Path Method – Project Evaluation and Review Technique – Resource Analysis in Network Scheduling	**20%**
V	**Sequencing and Simulation** Two Machine Problem Three Machine Problem Simulation and related numerical Importance of Simulation in Computer Science	**20%**
Basic Text & Reference Books :-		
1.	Taha H.A., "Operations Research : An Introduction " 8th Edition, Pearson Education, 2008.	
2.	John W. Chinneck "Feasibility and Infeasibility in Optimization Algorithms and Computational Methods' Springer, 2008	

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Paper Code: CCCS817			**Total Credit :** 4 **Total Marks :** 70 **Time :** 3 Hrs
Title of Paper: Optimization Techniques			
Unit	**Description**		**Total Marks**
I	Q.1 (A) Short Medium Questions. (With Internal Option)	06	14
	Q.1 (B) Medium / Long Questions. (With Internal Option)	08	
II	Q.2 (A) Answer the Following. (With Internal Option)	06	14
	Q.2 (B) Medium / Long Questions. (With Internal Option)	08	
III	Q.3 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.3 (B) Medium / Long Questions. (With Internal Option)	08	
IV	Q.4 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.4 (B) Medium / Long Questions. (With Internal Option)	08	
V	Q.5 (A) Short / Medium Questions (With Internal Option)	06	14
	Q.5 (B) Medium / Long Questions. (With Internal Option)	08	