



**B.Sc.(IT)**

**[Bachelor of Science in Information Technology]**

**[Semester – V & VI]**

**( Effective From June – 2018 )**

**Academic Year : 2018-19**

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**Syllabus pattern of B.Sc.(IT)**

**[Bachelor of science in information technology]**

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| --- | --- | --- | --- | --- | --- |
| **(SEMESTER-V)** | | | | | |
| **Code** | **Subject** | **Credit** | **Int.**  **Marks** | **Ext.**  **Marks** | **Total**  **Marks** |
| **CS-25** | **Programming with ASP.NET** | **5** | **30** | **70 (14x5)** | **100** |
| **CS-26** | **Advanced Java Programming** | **5** | **30** | **70 (14x5)** | **100** |
| **CS-27** | **Search Engine Techniques and Digital Technology Trends** | **5** | **30** | **70 (14x5)** | **100** |
| **CS-28** | **Practicals (Based on CS- 26)** | **5** | **-** | **-** | **100** |
| **CS-29** | **Practicals (Based on CS-25 And CS-27)** | **5** | **-** | **-** | **100** |
| **CS-30** | **Project Development** | **5** | **-** | **-** | **100** |
| **Total Credits** | | **30** | **Total Marks** | | **600** |

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| **(SEMESTER-VI)** | | | | | |
| **Code** | **Subject** | **Credit** | **Int.**  **Marks** | **Ext.**  **Marks** | **Total**  **Marks** |
| **CS-31** | **Mobile Computing using Android & iPhone** | **5** | **30** | **70 (14x5)** | **100** |
| **CS-32** | **Data Warehousing with SQL Server 2012** | **5** | **30** | **70 (14x5)** | **100** |
| **CS-33** | **Internet of Things(IOT)** | **5** | **30** | **70 (14x5)** | **100** |
| **CS-34** | **Practical – 1 (Based on CS-31)** | **5** | **-** | **-** | **100** |
| **CS-35** | **Practical – 2 (Based on CS-32 & CS-33)** | **5** | **-** | **-** | **100** |
| **CS-36** | **Project Development** | **5** | **-** | **-** | **100** |
| **Total Credits** | | **30** | **Total Marks** | | **600** |

**Structure of Theory Examination Paper – External**

**(**for **B**achelorof **S**ciencein **I**nformation **T**echnology**)**

|  |
| --- |
| **Question Paper contains 5 Questions (each of 14 marks). Every Question is divided in four parts like (a), (b), (c) and (d). Every Question will be asked from corresponding unit as specified in the syllabus of each course. (i.e. Question-1 is from Unit No. 1 and remaining questions from their corresponding Units).** |
| **TOTAL MARKS : 70, TOTAL TIME : 2½ HOURS** |

**General Instructions:**

1. Time duration of each theory paper will be of 2 hours.
2. Total marks of each theory paper will be 70 marks.
3. Total marks of each theory paper are 100 (university examination 70 marks + internal examination 30 marks).
4. Total marks of each practical and project-viva paper are 100. No internal examination marks in practical and project-viva papers.
5. There will be internal option for all the questions(as shown in table above)
6. All questions are compulsory.
7. Credit of each subject is 5. Total credit of semester is 36.

**Instructions to the candidates for Practical Examination:-**

1. All the students have to remain present at the examination centre 15 minutes before the scheduled time for examination.
2. Students have to carry with them certified journal, I – card, examination receipt, and other necessary requirements for examination.
3. Candidate should not leave the laboratory without the permission of examiner.
4. Use of calculator is allowed but the use of mobile phones is strictly prohibited.
5. The candidate has to leave the laboratory only after the submission of all the answer sheets of the exercises performed.

**B.Sc.(IT) SEMESTER – V**

**CS-25 : Programming with ASP.Net**

1. **Framework & Web Contents [20]**

Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications Web servers, installation of IIS.

Web forms, web form controls server controls, client controls, web forms & HTML, Adding controls to a web form ,Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box, etc. Running a web Application, creating a multiform web project.

1. **Validation & State Management [20]**

Form Validation Client side validation, server Side validation

Validation Control Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control.

State management View state, Session state, Application state

1. **ADO.Net Database & LINQ [20]**

Architecture of ADO.NET

Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, DataAdapter Class, Dataset Class.

Display data on data bound Controls and Data Grid.

Database Accessing on web applications Data Binding concept with web, creating data grid, Binding standard web server controls.

Display data on web form using Data bound controls.

Language Integrated Query(LINQ)

1. **Using XML [20]**

Writing datasets to XML, Reading datasets with XML.

Web services Introduction, Remote method call using XML, SOAP, web service description language, building & consuming a web service, Web Application deployment.

1. **Web Application and Configuration [20]**

Overview Asp.net Configuration, Common Configuration, Tracing, Custom Error, Authentication & Authorization, AJAX Web Services

**References:**

1) ASP.Net – Unleashed,

2) ASP.Net - Wrox Publications

**CS-26 : Advanced JAVA Programming**

1. **Distributed Computing using RMI, Database Programming with JDBC**

Introduction to RMI, RMI Architecture, Stubs and Skeleton, **[05]**

Introduction and Need for JDBC, Database Drivers, JDBC APIs for database Connectivity (Java.sql Package), Connection, Statement, Prepared statement, Callable statement, Result set, Other JDBC APIs, Database Meta Data, Result Set Meta Data **[15]**

1. **Servlet Programming [20]**

Servlet Basics, Basic Servlet structure, Servlets Generating text/html content, Packaging Servlets, The servlet life-cycle.

Handling Client Request Form Data, Reading Form Data from Servlets, Handling Client Request, Reading Request Headers, Understanding HTTP/1.1 Request Headers, Changing the page according to how the user got there, Accessing the Standard CGI Variables.

Generating the Server Response, HTTP Status Codes, Specifying Status Codes, HTTP / 1.1 Status Codes, Using Redirections, HTTP Response Headers, Setting Response Headers from Servlets, Understanding HTTP / 1.1 Response Headers, Using Servlets to Generate JPEG Images.

Handling Cookies, Remembering Usernames and Passwords, Deleting Cookies, Sending and Receiving Cookies, Using Cookie Attributes, Differentiating Session Cookies from Persistent Cookies, Using Cookies to Remember User Preferences, Session Tracking, Need for Session Tracking, Session Tracking API, Encoding URLs Sent to the Client, Accumulating a List of User Data

1. **Listeners and Filters [20]**

Listeners and Filters Using ServletContextListener,

HttpSessionListener, Understanding of all the other Listeners viz. ServletRequestListener, ServletContextAttributeListener, ServletRequestAttributeListener, HttpSessionAttributeListener

Using Filters for pre and post processing of request.

1. **JSP Programming [20]**

JSP Basic Syntax, HTML Text, HTML comments, Template Text, JSP Comment, JSPExpression, JSP Scriptlet, JSP Declaration, JSP Directives, JSP Action, JSP Expression Language Element, Custom Tag (Custom Action), Escaped Template Text, Using JSP Scripting 08 Elements, Using Predefined Variables, XML syntax for Expressions, Scriptlets, Declarations and Directives, Using Scriptlets, Using Declarations, Using Page Directive, Using Standard Actions Tags – , , , Using JavaBeans in JSP pages – , , , Sharing Beans, Use of Scopes and their Attributes

1. **MVC, Tag Library [20]**

Integrating Servlets and JSP in a Web Application (MVC Architecture for Web Applications), Implementing MVC with Request Dispatcher, Understanding Data Sharing Between Servlets and JSP,

JSP Expression Language, Accessing Scoped Variables, Bean Properties, Collections and Implicit Objects Using EL, Using EL Operators

Tag Library– Basics; Using JSTL – c:out, c:forEach, c:forTokens, c:if, c:choose, c:set, c:remove, c:import, c:url, c:param, c:redirect and c:catch Tags

**References Books**

1. Complete reference J2EE
2. Professional Java Server Programming J2EE 1.3 Edition Apress Publication
3. Beginning Java J2EE 5 from Novice to Professional Apress Publication

**CS-27 : Search Engine Techniques and Digital Technology Trends**

1. **The Search Engines: Reflecting Consciousness and Connecting Commerce Search Engine Basics [20]**

The Mission of Search Engines, The Market Share of Search Engines, The Human Goals of Searching, Determining Searcher Intent: A Challenge for Both Marketers and Search Engines, How People Search?, How Search Engines Drive Commerce on the Web?, Eye Tracking: How Users Scan Results Pages?, Click Tracking: How Users Click on Results? Natural Versus Paid, Understanding Search Engine Results, Algorithm-Based Ranking Systems: Crawling, Indexing, and Ranking, Determining Searcher Intent and Delivering Relevant, Fresh Content, Analyzing Ranking Factors, Using Advanced Search Techniques, Vertical Search Engines, Country-Specific Search Engines

1. **Determining SEO Objectives and Defining Site’s Audience First Stages of SEO [20]**

Setting SEO Goals and Objectives, Developing an SEO Plan Prior to Site Development, Understanding Audience and Finding Niche, SEO for Raw Traffic, SEO for E-Commerce Sales, SEO for Mindshare/Branding, SEO for Lead Generation and Direct Marketing, SEO for Reputation Management, SEO for Ideological Influence, The Major Elements of Planning, Identifying the Site Development Process and Players, Defining Site’s Information Architecture, Auditing an Existing Site to Identify SEO Problems, Identifying Current Server Statistics Software and Gaining Access, Determining Top Competitors, Assessing Historical Progress Benchmarking Current Indexing Status, Benchmarking Current Rankings, Benchmarking Current Traffic Sources and Volume, Leveraging Business Assets for SEO, Combining Business Assets and Historical Data to Conduct SEO/Website SWOT Analysis

1. **Developing an SEO-Friendly Website [20]**

Making Site Accessible to Search Engines, Creating an Optimal Information Architecture, Root Domains, Subdomains, and Microsites, Optimization of Domain Names/URLs, Keyword Targeting, Content Optimization, Duplicate Content Issues Controlling Content with Cookies and Session IDs, Content Delivery and Search Spider Control Redirects, Content Management System (CMS) Issues, Optimizing Flash, Best Practices for Multilanguage/Country Targeting

1. **Keyword Research, Optimizing for Vertical Search [20]**

The Theory Behind Keyword Research, Traditional Approaches: Domain Expertise, Site Content Analysis Keyword Research Tools, Determining Keyword Value/Potential ROI, Leveraging the Long Tail of Keyword Demand, Trending, Seasonality, and Seasonal Fluctuations in Keyword Demand, The Opportunities in Vertical Search, Optimizing for Local Search, Optimizing for Image Search, Optimizing for Product Search, Optimizing for News, Blog, and Feed Search, Others: Mobile, Video/Multimedia Search

1. **Digital Technology Trends [20]**

**Digital Business**

* Introduction to digital business,
* difference between digital business and ecommerce,
* digital business opportunities,
* Risk and barriers to digital business adoption

**Block Chain Technology**

* Tracing blockchain origin,
* Blockchain feature,
* How BlockChain Work?

**Virtual Reality, Augmented Reality(AR):**

* Introduction to Virtual Reality (VR),
* Needs of VR
* Introduction and brief history of AR
* Difference between AR and VR
* opportunities for augmented reality

**Reference book :**

1. The Art of SEO : Mastering Search Engine Optimization By Eric Enge, Stephan Spencer, Rand Fishkin, Jessie C Stricchiola, O'Reilly Media, October, 2009
2. Web Searching Technology and Search Engine Optimization[ISBN: 978 - 93 - 81786 - 92 - 5] by Bharat & Company
3. SEO: Search Engine Optimization Bible, By Jerri L. Ledford, 2nd Edition, Wiley India, April, 2009
4. SEO Warrior: Essential Techniques for Increasing Web Visibility By John I Jerkovic, O'Reilly Media, November, 2009

**References:**

1. http://www.gartner.com/technology/research/digital-business/
2. https://blockchain.info/
3. Virtual Reality, Steven M. LaValle,University of Illinoise, Cammbridge University Press. http://vr.cs.uiuc.edu/
4. Augmented Reality: Ebok <http://libro.eb20.net/Reader/> rdr.aspx?b=1073012 Greg Kipper, Joseph Rampolia, Elsevier Science

**CS –28 : Practical & VIVA based On CS-25**

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| CS – 25 | Advance JAVA Programming (J2EE) | **100 Marks** |

**CS –29 : Practical & VIVA based On CS-26 & CS-27**

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| CS – 26 | Programming with ASP.NET | **100 Marks** |
| CS – 27 | Web Searching Technology and Search Engine |

**CS –30 : Project VIVA**

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| CS – 30 | Project must be developed in the computer Lab. of concern institute under the supervision of faculties of concern institute on any subject of previous semester or current semester.(At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode) | **100 Marks** |

**Note :**

1. Project must be submitted before two week of commencement of theory exam.
2. Project viva examination may be arranged before or after theory exam.
3. During the project viva examination project must be run.

**B.Sc.(IT) SEMESTER – VI**

**CS-31 : Mobile Computing using Android**

1. Introduction to Android, Android Application Design [20]

* The Open Handset Alliance
* The Android Platform, Android SDK
* Building a sample Android application
* Anatomy of an Android applications
* Android terminologies
* Application Context, Activities, Services, Intents
* Receiving and Broadcasting Intents
* Android Manifest File and its common settings
* Using Intent Filter, Permissions
* Managing Application resources in a hierarchy
* Working with different types of resources

1. Android User Interface Design [20]

* User Interface Screen elements:
* Button, EditText, TextView, DatePicker, TimePicker, ProgressBar, ListView, GridView, RadioGroup, ImageButton, Fragement,
* Designing User Interfaces with Layouts
* Relative Layout, Linear Layout, Table Layout
* Dialogs
* Drawing and Working with Animation
* Frame by Frame Animation, Twined Animation

1. Database Connectivity Using SQLite & Content Provider [20]

* Using Android Data and Storage APIs
* Managing data using SQLite
* Sharing Data Between Applications with Content Providers

1. Location Based Services (LBS), Common Android API, [20]

* Using Global Positioning Services (GPS)
* Geo coding Locations
* Mapping Locations
  + - Many more with location based services
* Android networking API
* Android web API
* Android telephony API

1. Notifications, Services, Deployment of applications [20]

* Notifying the user
* Notifying with the status bar
* Vibrating the phone
* Blinking the lights
  + - Customizing the notifications
* Services
* Application development using JSON in MySQL.
* Publish Android Application

**CS-32 : Data Warehousing with SQL Server 2012**

1. Introduction to Data Warehousing [20]

* What is Data Warehouse?
* Data Warehousing Today
* Future Trends in Data Warehousing
* Data Warehouse Architecture
* Data Flow Architecture

1. Designing and Implementation of Data Warehousing [20]

* Logical Design for Data Warehouse
* Physical Design for Data Warehouse
* Design Dimension Table, Fact Table for Data Warehouse
* Design and Implement effective physical Data structure for Data Warehouse

1. Creating ETL Solutions with SSIS, Implementing Control Flow in SSIS [20]

* Introduction to ETL with SSIS
* Exploring Data Sourcing
* Implementing Data Flow using SSIS
* Introduction Control Flow
* Creating Dynamic Packages
* Using Containers

1. Enforcing Data Quality, Extending SQL Server Integration Services [20]

* Introduction to Data Quality
* Using Data Quality Service to Cleanse data
* Using Data Quality Service to match data
* Using Scripts in SSIS
* Using Custom components in SSIS

1. Deploying and Configuring SSIS Packages, Consuming Data in Data Warehouse [20]

* Overview of SSIS Development
* Deploying SSIS Projects
* Planning SSIS Package Execusion
* Introduction to Business Intelligence
* Introduction to Reporting
* Introduction to Data Analysis

**Notes: For Lab Practice: Microsoft SQL Server 2012 or Higher version**

**References Books:**

* 1. Implementing a Data Warehouse with Microsoft® SQL Server® 2012 Dejan Sarka Matija Lah Grega Jerkič
  2. Building a Data Warehouse: With Examples in SQL Server – Vincent Rainardi-Apress(2014)
  3. Data mining Explained A manager’s guide to customer centric business intelligence by
  4. Data mining by Pieter Adriaans, Dolf Zantinge
  5. Data warehousing in the real world A practical guide for business DSS by Sam Anahory

**CS- 33 : Internet of Things (IOT)**

1. **IOT An Overview [20]**

Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management

1. **Reference Architecture [20]**

IOT Architecture-State of the Art – Introduction, State of the art, Reference Model and architecture, IoT reference Model - IoT Reference Architecture Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. RealWorld Design Constraints- Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control.

1. **IOT Data Link Layer & Network Layer Protocols [20]**

PHY/MAC Layer(3GPP MTC, IEEE 802.11, IEEE 802.15), Wireless HART, Z-Wave, Bluetooth Low Energy, Zigbee Smart Energy, DASH7 - Network Layer-IPv4, IPv6, 6LoWPAN, 6TiSCH,ND, DHCP, ICMP, RPL, CORPL, CARP

1. **Transport & Session Layer Protocols [20]**

Transport Layer (TCP, MPTCP, UDP, DCCP, SCTP)-(TLS, DTLS) – Session Layer-HTTP, CoAP, XMPP, AMQP, MQTT

1. **Service Layer Protocols & Security [20]**

Service Layer -oneM2M, ETSI M2M, OMA, BBF – Security in IOT Protocols – MAC 802.15.4, 6LoWPAN, RPL, Application Layer

**References Books**

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, “From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”, 1st Edition, Academic Press, 2014.
2. Bernd Scholz-Reiter, Florian Michahelles, “Architecting the Internet of Things”, ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
3. Vijay Madisetti and ArshdeepBahga, “Internet of Things (A HandsonApproach)”, 1 st Edition, VPT, 2014.
4. Bernd Scholz-Reiter, Florian Michahelles, “Architecting the Internet of Things”, ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer.
5. Francis daCosta, “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, 1st Edition, Apress Publications, 2013
6. Peter Waher, “Learning Internet of Things”, PACKT publishing, BIRMINGHAM – MUMBAI
7. http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot\_prot/index.html

**CS-34 : Practical based on CS-31**

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| CS – 31 | Mobile Computing using Android | **100 Marks** |

**CS-35 : Practical based on CS-32 & CS-33**

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| CS – 32 | Data Warehousing with SQL Server 2012 | **100 Marks** |
| CS – 33 | Internet of Things(IOT) |

**CS –36 : Project VIVA**

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| CS – 36 | Project must be developed in the computer Lab. of concern institute under the supervision of faculties of concern institute on any subject of previous semester or current semester. (At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode) | **100 Marks** |

**Notes :**

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2. Project viva examination may be arranged before or after theory exam.
3. During the project viva examination project must be run.