SYLLABUS

B.sc. Computer Application

DEPARTMENT OF COMPUTER SCIENCE

ST. XAVIER'S COLLEGE,

(AN AUTONOMOUS COLLEGE
UNDER RANCHI UNIVERSITY)

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COMPUTER APPLICATION **SEMESTER –I**

Comment [A1]:

PAPER 1(a): COMPUTER ORGANISATION, ARCHITECTURE AND SYSTEM ANALYSIS & DESIGN

Number System, Binary nos, Signed/Unsigned nos., 2's complements nos,

Boolean algebra, De Morgan;s Theorem, Simplification of Boolean Expressions, Karnaugh Map.

Logic Gates, Truth Tables, Combinational Logic Circuits & Realizations with Logic Gates- Half & Full Adders and codes, Multiplexers, Demuliplexers, Encoders, Decoders,

Code Converters.

Sequential Circuits, JK RS, T, D Master –Slave Flip Flops, Shift register, Synchronous and Asynchronous counters. Architecture of a simple Computer, Microprocessor , Architecture of 8085 & 8086, Registers and ALU, Instruction set, Addressing Modes, Timing diagram, Fetch , decode and Execute Cycle, Interrupt , Mechanism, DMA. Examples of ALP: Sorting, Code Conversion, Data Transfer and operations on data. Memory and Memory Organization, ROM, EPROM, SRAM, DRAM & Auxiliary Memory.

PAPER 1 (b) : PRACTICAL

(a) Slide making & presenting using MS- Power Points (MS-Office 2000)

(b) Editing, mail merging ,macros using MS – Word (MS-Office 2000)

(c) Spreadsheets, worksheets application using MS- Excel (MS-Office 2000)

PAPER 2 (a): DATA STRUCTURE & PROGRAMMING IN C

C Programming : Structure of a C program, variables, constants, modifiers, escape sequences, expressions and operators, Formatted and operators , Formatted input and Output, standard input and output, Control flow, if-else, if, do-while, while, switch –case, for, use of break and continue. String/ character handling, one& two dimensional arrays, function and arguments, passing parameters, recursive function structures, sorting& searching Pointers, pointers in functions, linked lists, files in C, preprocessor, error handling.

Data structure: primitive &Non –primitive data, arrays, stack, queue, circular queue, linked lists, Non linear data structure : binary tree, binary search tree representation, operations, thread representations, sequential representations sorting & searching techniques.(Algorithms related to insertion at a point, deletion from a point , etc is to be asked).

PAPER 2 (b) PRACTICAL

Programming using C

COMPUTER APPLICATION **SEMESTER –II PAPER 3(a) OPERATING SYSTEMS**

What is an operating System ? simple batch systems, multi programmed batch systems, time-sharing systems, parallel distributed systems, real-time systems

Computer System structure- Computer System Operation I/O structures storage structure, storage hierarchy and hardware protection.

Operating System structure- System components, system services, system calls , system programs and system structure – simple structure.

Process concept: process state, process control blocks, process scheduling and schedulers threading.

CPU scheduling, CPU-I/O burst cycle, scheduling criteria scheduling algorithms (Non pre-emptive – FCFS, SJFS, P re- emptive –SJFS , and RR).

Memory management (contiguous allocation, paging, Swapping, Segmentation). Virtual memory- Demand paging, page replacement, page replacement algorithms (FIFO, LRU)

Thrashing.

File system structures, file allocation (contiguous, linked, indexed), free space management (bit vector, linked list, grouping, counting).

I/O Hardware, Polling, Interrupts, DMA, Spooling, Buffering.

Disk structure, Disk scheduling (FCFS, SSTF, SCAN) , disk management – formatting boot block, bad block, swap space management.

Security- The problem, authentication and program-threats, encryption.

LINUX System- Process management, scheduling, memory management, file system, input and output, file structure, inodes, and commands.

PAPER 3 (b): PRACTICAL

a)Creation of Batch files

b) Extension of DOS commands- CLS, MD,RD, DATE, TIME, VER, COPY, REN, DEL,

TYPE, PATH, PROMPT, LABEL, DIR, XCOPY, DISKCOPY, DELTREE

C) Unix Commands –Is, Pwd, who, whoami,cd, mkdir, date, cal, banner , cp, mv

rmdir, chmod, man, cat

d)Win 98 environment –creating icons, OLE drag & drop, setting and configuration.

PAPER 4 (a) : PROGRAMMING USING C ++

Concepts of OOPS and differences with procedural languages, characteristics of OOPS (Idea of objects , class, data abstraction & encapsulation , inheritance, polymorphism, dynamic binding,, I/O stream, Cin, Cout, I/O manipulation).

Data Types, operators, control structure & looping statements, functions, and arrays Objects & classes: classes and objects, constructor, destructor, overloading binary operators, data conversion,

Inheritance: Derived class and base class, protected access specifier, derived class constructors, class hierarchies, abstract base class, public and private inheritance,

Multiple inheritances, containership (class within classes).

Pointers: Address and pointers, pointers and arrays, memory management. “new” & “delete” pointer to objects, linked list, pointer to pointer.

Virtual functions: Virtual functions, Friend functions, static functions, and “this” pointer. Files and streams: String, String I/O, object I/O , I/O with multiple objects file pointer, error handling, and redirection.

PAPER 4 (b) : PROGRAMMING USING C ++

COMPUTER APPLICATION **SEMESTER -III**

PAPER 5 (a) VISUAL BAISC. NET FOR DESKTOP APPLICATINS

Using Visual Studio. NET IDE to develop VB. NET , application, creating Windows form, Using Object- oriented Programming through VB. NET, Creating procedures, Using Common dialogue classes, Retrieving and manipulating data to store in data base by ADO. NET.

Generating a report using crystal report.

Creating MDI applications, Creating menus, Performing File Input/ Output. Creating multi- threaded applications

Handling exception, debugging application, creating application assistant from help system, creating and using components, creating user control,

Creating and using web-service.

Deploying an application.

PAPER 5 (b) : PRACTICAL

Designing simple layouts using buttons, textbox, label, combo box etc. Making a front end application to connect to remote or local database. Generating simple client applications.

PAPER 6 (a) COMPUTER GRAPHICS

Overview of Graphics systems

Video display devices, refresh cathode ray tubes, raster- scan and random-scan display, colour CRT monitor, direct view storage tubes, random scan systems.

OUTPUT PRIMITIVES

Point and lines, line drawing algorithm, DDA and Bresenham's line and parallel line drawing algorithm, circle and ellipse generating algorithm conic section, curve function, polynomials and spline curves pixel addressings, filled area. Scan-line algorithm, boundary fill and flood-fill algorithm.

Two dimensional geometric transformation & viewing.

Basic transformation, matrix representation ,composite transformation (translation, rotation, & scaling). Raster methods for transformation, viewing pipeline, viewing coordinates frame, clipping (point, line & polygon), Cohen Sutherland line clipping algorithm.

Visible surface detection methods.

Classification of visible surface detection algorithm, back face detection algorithm, depth buffer algorithm.

PAPER 6(b) : PRACTICAL

Multimedia Application development using Flash.

COMPUTER APPLICATION **SEMESTER IV**

PAPER 7 (a) DATABASE MANAGEMENT SYSTEM & ORACLE

Introduction to DBMS, Purpose, difference with respect to conventional file processing system, data abstraction, data independence, data models (object-based, record based, physical data models), database manager, database administrator , overall system structure.

Entity- Relationship model, Relationship sets, Mapping, Keys and entity sets. Entity- Relationship diagram, specialization, generalization and aggregation, database schema under relational model.

Relationship algebra –Project, select, Cartesian product, joins, natural join, union,

Intersection, minus, division operations.

Normalization – Functional dependency, INF, 2NF, 3NF, BCNF, multivalued dependency & 4NF. Lossless joins, dependency preservation, redundancy control and integrity preservation during decomposition.

Transaction- concepts, transaction state, concurrent executions, serializability, conflict serializability, view serializability.

Concurrency control-locks, granting of locks, timestamps based protocols, deadlock prevention, detection & recovery.

Security & integrity violation. Authorization, views, timestamp based protocols, deadlock prevention, detection & recovery.

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Oracle:- Oracle functions, SQL (DDL, DML), simple queries, nested sub- queries, self join , equijoin, non-equijoin, PL/SQL programming (writing small blocks for data Manipulation). Update , Insert, Triggers, Views and grants under Oracle (DCL).

PAPER 7 (b) : PRACTICAL

Writing and executing simple and complex queries, creation and alteration of tables updating, inserting, deleting, to/from a table.

Writing simple PL/SQL codes for data manipulation, database triggers.

PAPER 8 (a) SOFTWARE ENGINEERING

Introduction to Software Engineering: Software development and life cycle, Project size its categories, planning and software project, project-control and project team standards, Design of strategies, Software cost estimation and evaluation techniques.

Software Design: Various design concepts and notations, Modern design techniques verification and validation methods, Documentation and implementation procedures : Performance of software systems, software metrics and model. Documentation of Project –system, manuals and implementation.

Software Testing : Testing fundamentals, types of testing, testing tools, Automated testing.

Software Maintenance: Maintenance characteristics, Maintenance tasks, Side effects, Reverse engineering techniques.

Software Reliability : Definition and concept of software reliability: Software errors, faults, repair and availability: Reliability and availability models, use of database as a study tool.

PAPER 8 (b) PRACTICAL

Object oriented data modeling using UML concepts applying Rational Rose.

COMPUTER APPLICATION **SEMESTER –V**

PAPER 9(a) : DATA COMMUNICATION & NETWORKING INTRODUCTION TO INTERNET

A communication model, communication tasks, three- layer approach to protocols, brief introduction to TCP/IP and OSI (brief function to different layers).

Data transmission: concepts and terminology, analog and digital data transmission.

Transmission impairments , Guided transmission media.

Data encoding, digital data digital signal, digital data analog signal, analog data digital signal and analog data analog signal.

Asynchronous & synchronous transmission, interfacing.

Data link control: flow control, error detected (CRC). Error control, High level data

Control (HDLC).

Multiplexing, statistical time division multiplexing.

Circuit switching: switched network, circuit switching networks, switching concepts, routing in circuit switched networks.

Packet switched : packet switching principals, routing, congestion and control, X.25, Digistra's alogorithm, Bellman ford algorithm.

LAN Technology : LAN architecture , Bus/Tree LAN , Ring & stat LANs Ethernet and

Fast Ethernet (CSMA/CD), Token ring and FDDI.

Bridges: Bridge operation, routing and bridges

Network Security: Requirements, conventional encryption, public key encryption& digital signature. (no numerical related questions are to be asked).

XML : Introduction to XML, Document type definition (DTD), XML, schema-declaring attributers, namespaces, grouping elements and attributes. Rendering XML document- CSS, XSLT. Displaying data with XSLT, displaying data in tabular format, using HTML tags within XSLT. XML document object model – Objects and methods, using XML DOM objects in scripts.

PAPER 9 (b) PRACTICAL Creating XML document, XML schema, Declaring attributes & using component of one schema into another, creating XSLT style for formatting data, validating an XML document against a DTD by DOM.

PAPER 10(a) PROGRAMMING IN JAVA

Introduction to Java: History of Java, features of Java, types of Java programs.

JDK tools: Java compiler, Java Interpreter, applet viewer, Jot tool, Javap disassemble, Javadoc Tool, Javah tool, java Keywords, data types in java, variable naming conventions, Initializing variables, literals, operators, type conversion, Duiston construct, looping construct, Arrays.

Classes and objects: Declaring classes, creating objects, declaring objects, declaring methods, passing arguments to methods, constructors, access specifiers, modifiers, the main() method, Overloading.

Relationship between classes.

Applet & applications: Applet class, Applet & HTML, Life cycle of an Applet, Graphic class, Font class, passing parameters to applets, creating an application, converting applets to applications.

Introduction to threads:

Threads, single treaded and multithreaded applications, life cycle of a thread, the current thread, the thread class, problems in multithreading.

Packages: Java packages, using a package, the Lang package, the util package, the collection class, creating a package.

PAPER 10(b): PRACTICAL

Simple programming using Java, applet creation, servlet development.

COMPUTER APPLICATION **SEMESTER- VI** **PAPER 11(a): ON JOB TRAINING I & II**

PAPER II (b): PROJECT WORK **PAPER 12: ENTREPRENEURSHIP DEVELOPMENT**

- Need, scope and characteristics of Entrepreneurship, special schemes for Technical Entrepreneurs, STED.
- Identification of opportunities.
- Exposure to demand based, resource based, service based, import substitute and export promotion industries.
- Market survey techniques.
- Need scope & approaches for project formation.
- Criteria for principles of product selection and development.
- Structure of project report
- Choice of technology, plant and equipment.
- Institutions, financing procedure and financial incentives.
- Financial ratios and their significance.
- Books of accounts, financial statements and fund flow analysis.
- Energy requirement & Utilization.
- Resource Management Men, Machine and Materials.
- Critical path Method (CPM) & Project Evaluation review techniques (PERT) as planning tools for establishing SSI..
- A) Creativity and Innovation B) Strength weakness opportunity and threat (SWOT) techniques.
- Techno – economic feasibility of the project.
- Plant layout & process planning for the product.
- Quality control/ quality assurance and testing of product.
- Elements of Marketing and Sales Management.
- 1) Nature of products and market strategy 2) Packaging and Advertising 3) after sales service.
- Costing and pricing.
- Management of self and understanding human behavior.
- Sickness in small scale industries and their remedial measures.
- Coping with uncertainties, stress management & positive reinforcement.
- 1) Licensing, registration 2) Municipal bye laws and insurance coverage.
- Important provisions of factory act, Sales of Goods Act, partnership Act.
- 1) Dilution control 2) Social responsibility and business ethics.
- Income Tax, Sales Tax and excise rules.

PRACTICALS 15 HOURS OF TEACHING LOAD

- **CONDUCT OF MINI MARKET SURVEY** (One day Exercise): Data collection through questionnaire and personal visits.
- Entrepreneurial Motivation Training: through games, role –playing, discussions and exercises.
- 1) Working capital and fixed capital: Practice assessment and management 2) Exercise on working capital: Practice fixed capital calculation.
- 1) Analysis of sample project report: Discussion 2) Break even analysis: Practice.
- Communication written and oral: Practice.