



TAMIL NADU GOVERNMENT GAZETTE

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Subject: Computer Instructor

SYLLABUS

COMPUTER SYSTEMS ARCHITECTURE

1. THE COMPUTER SYSTEM

Marks: 10

System buses: Computer Components, Computer function, Interconnection Structures.

Internal Memory: Computer Memory System Overview, Cache Memory.

Input/ Output: External Devices, Direct Memory Access, The External Interface.

Operating System Overview.

2. THE CENTRAL PROCESSING UNIT

Marks: 10

Computer Arithmetic: The Arithmetic and Logic Unit (ALU), Floating-Point Arithmetic.

Instruction Sets: Types of Operands, Types of Operation, Register Organization, The Instruction Cycle.

OPERATING SYSTEMS

Marks: 10

Introduction: System software, OS strategies; multiprogramming, batch.

Operating System Organization: basic OS function, kernels, device drivers.

Device Management: buffering.

Process Management: resource abstraction, process hierarchy.

Scheduling: Strategy selection.



Synchronization Principles: deadlock, semaphores, multiprocessors.

Deadlocks: hold and wait, Banker's Algorithm, consumable resources.

Memory Management: memory allocation strategies, variable partition.

Protection and Security: internal access authorization.

DIGITAL ELECTRONICS

Marks: 10

Fundamental Concepts: NAND, NOR and Exclusive-OR operation, Boolean Algebra.

Number system and Codes: Primary, Octal, Hexadecimal, Signed Numbers Codes.

Combinational Logic Design: K-map representation of logical functions and simplification using K-map of 4 and 5 variables.

Multiplexers, Decoders.

Flip-Flops: Edge triggered flip flop.

DATA STRUCTURES

Marks: 15

Abstract data types and objects, graphical user interfaces; language support and OOP: Inheritance, classes and subclasses, header files, overloading.

Programming with Data structures: Stacks, queues, lists, trees and balanced binary trees, algorithms for searching and sorting and open office.

PROGRAMMING IN C++

Marks: 20

- 1. Object Oriented Programming: Data hiding, Data encapsulation, Class and Object, Abstract class and Concrete class, Polymorphism (Implementation of polymorphism using Function overloading as an example in C++; Inheritance, Advantages of Object-Oriented Programming over earlier programming methodologies.**

2. Implementation of Object-Oriented Programming concepts in C++: Members of a class- Data Members AND Member Functions (methods), inside class definition and outside class definition using scope resolution operator (::) Objects as function arguments-pass by value and pass by reference;

Constructor and Destructor:

Constructor: Declaration and Definition of a constructor, Default Constructor, Overloaded Constructors

Destructor: Declaration and definition of destructor;

Inheritance (Extending Class): Concept of Inheritance, Base Class, Derived Class, Defining derived classes, Multilevel inheritance and Multiple inheritance,

Data File Handling:

Reading and Manipulation of text from an already existing text File (accessing sequentially);

3. Pointers:

Declaration and Initialization of Pointers: Dynamic memory allocation/ deallocation

operators: new, delete; Pointers and Arrays: Array of Pointers, Function returning a pointer.

Deference operator: *,->; self referential structures, Python, PHP;

RELATIONAL DATABASE MANAGEMENT SYSTEM

Marks: 10

1. Database Management System

Introduction to database concepts: Relation/ Table, Data, Concept of String Candidate key, Alternate key, Primary Key, Foreign Keys; Data Normalization-first, second, third, BCNF normal form;

Examples of Commercially available Database Management System's (Back-End) -MySQL,

Examples of Front End Software's Visual C++

2. RDBMS Tools: Oracle

Classification of SQL Statements: DML (SELECT, INSERT, UPDATE, DELETE),

SQL SELECT Statement: SQL SELECT statement, Selecting All the Columns, Selecting Specific Column, Column Heading Default,

SELECT Statement Continued: Limiting Rows during selection (using WHERE clause), Logical Operators, Use of Logical

Operators (AND/OR/NOT Operators), Logical Operator Precedence, ORDER BY Clause, Sorting in Ascending/ Descending Order,

Functions: SQL Functions, Types of SQL Function (Single Row/ Multiple Row), Character Functions UPPER () TRIM (). SUBSTR (). (ROUND (), TRUNC (), MOD()), Working with Dates [LAST_DAY(), MONTHS_BETWEEN(). ROUND(), Implicit and Explicit Conversion,

Grouping Records: Types of group functions [MAX () . MIN () . AVG () , SUM () . COUNT ()], using AVG and SUM Funcions, Group By Clause, Grouping By More than One Column, Having Clause.

Sub Queries: Guidelines for Using Sub Queries, Types of Sub-Queries (Single Row and Multiple Row)

Database Objects: DDL (Data Definition Language), , Creating Synonyms, Querying a View, Modifying a view. Including Constraints: UNIQUE KEY, PRIMARY KEY, FOREIGN KEY, FOREIGN KEY

Creation of a Table/ Relation: CREATE TABLE Statement, Creating a Table by Using a Sub-Query:

Managing Existing Tables and other Database Objects: The ALTER TABLE Statement, Adding a New Column in a Table, Dropping Tables;

BUSINESS COMPUTING

Marks: 15

Integration of User Interface and Database;

More application areas of Databases:

Inventory control, Financial Accounting, Fees Management System, Result Analysis System, Admission Management System, Income Tax Management System;

Advance Program Development Methodology: System Development

Life Cycle, Data Models (Entity Relationship Model), Attributes (Single, Composite and Multi- Valued), Relationship (One-to-One, One-to-Many and Many-to-Many SQL Statements,

Data Dictionary, Data Warehousing, Data Mining

WEB DEVELOPMENT

Marks: 10

HTM/ DHTML

Introduction, Objectives, Introduction to Universal Resource Identifier (URI)

Basic Tags of HTML: HTML, HEAD, TITLE, BODY, Ordered List-OL (L1, Type-1, I, A, a; START, VALUE), Unordered List-UL (Bullet Type- Disc, Circle, Square,-DL, DT, DD), Web Page Authoring Using HTML

Tables: Creating Tables, Border, WIDTH, CAPTION, ALIGN,

Frames: Frameborder, height and width,

Forms: Definition, MS-Access or Oracle,

Form Tags: FORM, METHOD, Document Object Model

1. Active Server Pages (ASP)

Active Server Pages (ASP): Concept of ASP, features of ASP,

Variables: Explicit and Implicit Declaration;



Functions:

String Manipulation Functions: Ucase (), Lcase (). Len(), Left (), Right (), Mid (), Ltrim (), InStr()

Time & Date Functions: Date (), Day(), Hour (), Left (), Len (), Minute (), Month (). Monthname (). Now ();

Arrays: Declaration and use of 1 dimensional and 2 dimensional arrays;

Procedures and Functions, Passing parameters/ arguments;

Connecting with Databases: Creation of DSN, using OLEDB.

WEB SCRIPTING

Marks: 10

1. Java Script

Event handling, Adding Java Script in an HTML Page

MULTIMEDIA AND AUTHORING TOOLS

Image Formats

TIFF, BMP, JPG/ JPEG, GIF, IC, PDF, PSD:

Image Scanning with the help of scanner: Setting up Resolution, Size, File formats of images; image preview

Significance of PDF-creation, modification; Animation, Morphing and Applications

Graphic Tools: Image Editing Software (Photoshop/ CorelDraw)

Image Handling: Cropping an image, adjusting image size, saving an image:

Layers: Adding layers, dragging and pasting selections on to layers, moving and copying layers, duplicating layers, deleting layers, merging layers. Opacity.

Concept of Multimedia: Picture/ Graphics, Audio, Video;



Sound: Recording Sound using Sound Recorder (Capture), Sound editing. Effect enhancement;

Voice Recognition Software Philips/ Dragon, MIDI Player, Sound Recorder.

Sound Quality: Radio Quality,

1. Movie File Formats: AVI, MPEG.

Movie Frames: Concept of Frame, Frame Buffer,;

2. Multimedia Authoring Using Macromedia Flash

Making of Simple Flash Movie,

COMMUNICATION AND NETWORK CONCEPTS

Marks: 20

Evolution of Networking: Internet;

Data Communication terminologies: Bandwidth (Hz, KHz, MHz) and Data transfer rate (bps, kbps, Mbps, Gbps, Tbps);

Network devices: Modem, Ethernet Card, Hub, Switch, Router,

Different Topologies- Bus, Tree; Concepts of LAN, WAN, MAN;

Protocol: TCP/IP, Internet, Wireless/ Mobile Communication, GSM, Electronic Mail, Chat, Video Conferencing;

Network Security Concepts: Cyber Law, Hackers and Crackers;

WebPages; Hyper TEXT markup Language (HTML), Hyper Text Transfer Protocol (HTTP);

Website, Web & Browser, Web Servers.



Educational Psychology

Unit - 1

Pre-primary Education - Programme of Pre-primary Education - universalization of Primary Education - Equality of opportunity - Secondary and Higher Secondary Education - Need for uniform pattern - Non-formal and Adult Education - Functional Literacy Programme - Programmes for workers in industry - programme for dropouts - Role of Educational institutions in Non-formal Education - Open School / Open University, Quantity and Quality of Education - State and National leave - Unemployment and underemployment - Delinking employment from degrees - Skill development - Vocation Skill oriented education - Man power planning and education Brain drain - Special problems of rural and tribal people - illiteracy and poverty - Eradication of poverty through Education.

Unit - 2

National integration - International understanding - Value Education in action- Nation and health - sanitation - Safety and first aid - Women's education - Education for handicapped Education for gifted - Population Education - Need for protecting the environment - Environmental Education - Language policy - Medium of education - channel of international communication Management of Schools, private, aided, Government, Local authorities - Government Department of education, administration and academic supervision - Headmaster / Headmistress as an administrator and academic supervisor.

History and Culture of Tamil Nadu:

Unit - 3

Political - Spiritual - Religion - Literature - Language - Education - Natural Resources - Trade - Occupations - Historical places - Tourist centres - Arts - Games - Society.

Unit -4

The Learner, Learning process - Learning situation - Significance of Education Psychology to the teacher concept of growth and maturity - development characteristics and trends - Development tasks and education - Development of mental abilities - Attention, inattention and distraction - span of attention, sensation and perception - factors in perception - Errors - concept formation - piglets states of cognitive development - concept maps language. Imagination, thinking and reasoning - Psycholinguistics - Implications for the teacher.

Unit -5

Special characteristics of adolescents and their problems, attitudes, interest, group behaviour, Discipline Leadership - Nature and importance of learning - individual differences in learning - Learning curves - Transfer of learning - Learning styles - Factors in learning - Types of learning - Trial and error - Conditioning - Classical and operant - Learning by insight - Imitation - Levels of learning - Remembering and forgetting - Learning Disabilities.

Unit - 6

Motivation - Maslow's hierarchy of needs - roles of rewards and punishments - Levels of aspiration - Achievement motivation - Goal as a motivational factor - Nature of intelligence - Theories of intelligence - Assessment of intelligence - IQ constancy - Distribution - uses of intelligence test - Creativity - Creativity and intelligence - Identification and promotion of creativity - Meaning of personality - Factors influencing personality - Assessment of personality - integrated personality - concept of mental health hygiene - conflict and frustration - Unrest - Adjustment - Defence mechanisms - Mental illness - Guidance and counselling.

Unit -7

Meaning of educational innovation - principles involved in innovation - Emergence of school -In cultural, social and religious setting - Innovations that emerged from educational experiments-Tagore:- Santiniketan- Gandhiji:- Basic Education - A.S.Neill;- Progressive School -Sri Aurobindo :- Ashram Schools. Rousseau: Children's Education - Montessori - Sense Experience - Bertrand Russel- Education for Social Order - Froebel-Kindergarten- Dewey- Pragmatic life J. Krishnamoorthy-Freedom in learning situation. Influence of



Psychological factors on innovation - principles underlying self-learning devices. Piaget- Experiment's and discovery learning - Child- centred learning. Effects of cultural, religious and social factors on innovation- Principles of equality - conformity to common educational goals.

Unit -8

Modernization of education - National Educational Policy (1986) - DPEP Special focus on Teacher Education (DTERT, DIETs, BRCs, CRCs) MLL based curriculum and syllabus - Joyful learning - Autonomy in institutional structures - Individual freedom- Library based learning: Self paced instruction -pace setting schools - Mobile schools- De-Schooling and non-classroom learning - community schools - school complex Distance education and open learning- Education through mass communication - special education -Sainik school - Defence academy - Educational Technology - need for and use of Industruational technology - mass media for instructional purposes - Review of radio and TV educational programmes - educational computing.



Subject: General Knowledge

Marks - 10

Unit-I

Indian Histroy

History of India - Vedic period 1526 AD to 1947 - Free India - Modern India

Unit - II

Indian Constitution

Origin of Indian Constitution - Salient and special features - Fundamental rights - Legislature - Judiciary Executive - Audit franchise - Human rights.

Unit - III



History of Tamil Nadu

Ancient period - Sangam age - Chera, Chola, Pandias - Economical, political, Social Conditions - Literature Architecture - Fine arts - Geography of Tamil Nadu - Natural boundaries - Resources - Rivers and places.

Unit-IV Personalities Books and authors - Discoveries

Unit-V Sports & Games Confined to India

Unit- VI Abbreviations

Unit – VII Every Day Science

Unit-VIII Current Affairs

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