

CUET -COMPUTER SCIENCE /INFORMATICS PRACTICES

GUIDELINES FOR THE STUDENTS TO PREPARE

Computer Science/Informatics Practices- 308

SYLLABUS:

Note:

*There will be one Question Paper which will contain Two Sections i.e. **Section A and Section B [B1 and B2].***

*Section A will have **15 questions** covering both i.e. Computer Science/Information Practices which will be **compulsory** for all candidates*

*Section B1 will have 35 questions from **Computer Science** out of which 25 questions need to be attempted.*

Section A

Exception and File Handling in Python

Exception Handling: syntax errors, exceptions, need of exception handling, user-defined exceptions, raising exceptions, handling exceptions, catching exceptions, Try - except - else clause, Try - finally clause, recovering and continuing with finally, built-in exception classes.

File Handling: text file and binary file, file types, open and close files, reading and writing text files, reading and writing binary files using pickle module, file access modes.

Database Concepts

Introduction to database concepts, difference between database and file system, relational data model: concept of domain, tuple, relation, keys - candidate key, primary key, alternate key, foreign key;

Relational algebra: selection, projection, union, set difference and cartesian product;

Structured Query Language

Advantages of using Structured Query Language, Data Definition Language, Data Query Language and Data Manipulation Language, Introduction to MySQL, Creating a database using MySQL, Data Types

Data Definition: CREATE TABLE, DROP TABLE, ALTER TABLE,

Data Query: SELECT, FROM, WHERE

Data Manipulation: INSERT, UPDATE, DELETE

Math functions: POWER (), ROUND (), MOD ().Text functions: UCASE ()/UPPER (), LCASE ()/LOWER (), MID ()/SUBSTRING ()/SUBSTR (), LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM ().

Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME ().

Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT (); using COUNT

(*). Querying and manipulating data using Group by, Having, Order by.

Operations on Relations - Union, Intersection, Minus, Cartesian Product, JOIN

Computer Networks

Introduction to computer networks, Evolution of networking,

Network types: LAN, WAN, MAN

Network devices: Modem, Ethernet Card, Repeater, Hub, Switch, Router, Gateway.

Network Topologies: Mesh, Ring, Bus, Star, and Tree topologies

Basic concept of MAC and IP Address

Difference between Internet and web

Section B1: Computer Science

Chapter 1: Exception and File Handling in Python

Exception Handling: syntax errors, exceptions, need of exception handling, user-defined exceptions, raising exceptions, handling exceptions, catching exceptions, Try - except - else clause, Try - finally clause, recovering and continuing with finally, built-in exception classes.

File Handling: text file and binary file, file types, open and close files, reading and writing text files, reading and writing binary files using pickle module, file access modes.

Chapter 2: Stack

Stack (List Implementation): Introduction to stack (LIFO Operations), operations on stack (PUSH and POP) and its implementation in python. Expressions in Prefix, Infix and postfix notations, evaluating arithmetic expressions using stack, conversion of Infix expression to postfix expression

Chapter 3: Queue

Queue (List Implementation): Introduction to Queue (FIFO), Operations on Queue (INSERT and DELETE) and its implementation in Python.

Introduction to DQueue and its implementation in Python.

Chapter 4: Searching

Searching: Sequential search, Binary search, Analysis of Sequential and Binary Search. Dry run to identify best, worst and average cases. Implementation of searching techniques in Python.

Chapter 5: Sorting

Overview of sorting techniques, Bubble Sort, Selection Sort and Insertion Sort. Dry run to identify best, worst and average cases. Implementation of sorting techniques in Python.

Hashing: Hash Functions, Collision Resolution, Implementing the Map Abstract Data Type.

Chapter 6: Understanding Data

Data and its purpose, collection and organization; understanding data using statistical methods: mean, median, standard deviation, variance; data interpretation; visualization of data.

Chapter 7: Database Concepts

Introduction to database concepts, difference between database and file system, relational data model: concept of domain, tuple, relation, keys - candidate key, primary key, alternate key, foreign key;

Relational algebra: selection, projection, union, set difference and cartesian product;

Chapter 8: Structured Query Language

Advantages of using Structured Query Language, Data Definition Language, Data Query Language and Data Manipulation Language, Introduction to MySQL, Creating a database using MySQL, Data Types

Data Definition: CREATE TABLE, DROP TABLE, ALTER TABLE,

Data Query: SELECT, FROM, WHERE

Data Manipulation: INSERT, UPDATE, DELETE

Math functions: POWER (), ROUND (), MOD ().

Text functions: UCASE ()/UPPER (), LCASE ()/LOWER (), MID ()/SUBSTRING ()/SUBSTR (), LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM ().

Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME ().

Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT (); using COUNT (*). Querying and manipulating data using Group by, Having, Order by.

Operations on Relations - Union, Intersection, Minus, Cartesian Product, JOIN

Chapter 9: Computer Networks

Introduction to computer networks, Evolution of networking,

Network types: LAN, WAN, MAN

Network devices: Modem, Ethernet Card, Repeater, Hub, Switch, Router, Gateway.

Network Topologies: Mesh, Ring, Bus, Star, and Tree topologies

Basic concept of MAC and IP Address

Difference between Internet and web

Section B2: Information Practices

Chapter 1: Database Query using SQL

Math functions: POWER (), ROUND (), MOD ().

Text functions: UCASE ()/UPPER (), LCASE ()/LOWER (), MID ()/SUBSTRING ()/SUBSTR (),LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM ().

Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME ().

Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT (); using COUNT (*).Querying and manipulating data using Group by, Having, Order by.

Operations on Relations - Union, Intersection, Minus, Cartesian Product, JOIN

Chapter 2: Data Handling using Pandas – I

Introduction to Python libraries- Pandas, NumPy, Matplotlib. Data structures in Pandas - Series and DataFrames.

Series: Creation of Series from – and array, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing, and Slicing.

DataFrames: creation - from the dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on Rows and columns: add, select, delete, rename; Head and Tail functions; Indexing using Labels, Boolean Indexing; Styling & Formatting data, Head and Tail functions; Joining, Merging and Concatenations.

Importing/Exporting Data between CSV files and DataFrames.

Chapter 3: Data Handling using Pandas – II

Descriptive Statistics: max, min, count, sum, mean, median, mode, quartile, Standard deviation, variance.

DataFrame operations: Aggregation, group by, Sorting, Deleting and Renaming Index, Pivoting. Handling missing values – dropping and filling.

Importing/Exporting Data between MySQL database and Pandas.

Chapter 4: Plotting Data using Matplotlib

Purpose of plotting; drawing and saving the following types of plots using Matplotlib – line plot, bargraph, histogram, pie chart, frequency polygon, box plot, and scatter plot.

Customizing plots: color, style (dashed, dotted), width; adding label, title, and legend in plots.

Chapter 5: Introduction to Computer Networks

Introduction to Networks, Types of networks: LAN, MAN, WAN.

Network Devices: modem, hub, switch, repeater, router, gateway

Network Topologies: Star, Bus, Tree, Mesh.

Introduction to Internet, URL, WWW, and its applications- Web, email, Chat, VoIP.

Website: Introduction, the difference between a website and webpage, static vs dynamic web page, webserver, and hosting of a website.

Web Browsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.

Chapter 6: Societal Impacts

Digital footprint, Etiquettes for Net surfing and for communicating through social media, data protection, Intellectual Property Rights (IPR) and their violation, plagiarism licensing and

copyrights, Free and Open Source Software (FOSS), Cybercrime and cyber laws, hacking, phishing, cyberbullying, Overview of Indian IT Act, preventing cybercrime.

E-waste its a hazard and management

Awareness about health concerns related to the usage of technology like effect on eyesight, physiological issues, and ergonomic aspects.

Chapter 10: Data Communication

Concept of communication, Types of Data Communication, switching techniques

Communication Media: Wired Technologies – Twisted pair cable, Co-axial cable, Ethernet Cable, Optical Fibre;

Introduction to mobile telecommunication

technologies Wireless Technologies – Bluetooth,

WLAN, Infrared, Microwave

Network Protocol: Need for Protocol, Categorization and Examples of protocol, HTTP, FTP, IP, PPP; electronic mail protocol

Concept of Channel, Bandwidth (Hz, KHz, MHz) and Data Transfer rate (bps, Kbps, Mbps, Gbps, Tbps)

Chapter 11: Security Aspects

Threats and prevention: Viruses, Worms, Trojan horse, Spam, Cookies, Adware, Firewall, http vs https

Network Security Concepts: Firewall, Cookies, Hackers and Crackers Antivirus and their workings

Network security threats: Denial of service, Intrusion problems, Snooping, Eavesdropping

Recommended books for CUET 2022- Computer Science/IP Preparation

Book Name	Publishing House	Author
Computer Awareness	Arihant	Arihant Experts
Class XI and XII Computer Science NCERT Textbook	NCERT	NCERT

Question Paper Pattern:

Total Questions Asked in Computer Science	85
Total Questions to be Attempted in Computer Science	65
Maximum Marks in Computer Science	325
Question Type	MCQs
Frequency of Exam	Once a year
Negative Marking	Applicable
Marking Scheme	Marks per correct attempt: +5
	Marks per incorrect attempt: -1
	Marks per unanswered & marked for review question: 0

SYLLABUS-COMPUTER SCIENCE (2021-22)

Deleted & and Out of Syllabus Portions

SECTION A:

- Exception Handling

SECTION B1:

- Queue
- Analysis of Sequential and Binary Search.
- Selection Sort
- Hashing: Hash Functions, Collision Resolution, Implementing the Map Abstract Data Type.(NOT included in CBSE syllabus)
- Dry run to identify best, worst and average cases. Implementation of searching techniques in Python. (NOT included in CBSE syllabus)
- Data and its purpose, collection and organization; understanding data using statistical methods: mean, median, standard deviation, variance; data interpretation; visualization of data. (NOT included in CBSE syllabus)

SYLLABUS-INFORMATICS PRACTICES (2021-22)

Deleted Syllabus

Chapter 1: Database Query using SQL

Operations on Relations - Union, Intersection, Minus, Cartesian Product, JOIN

Chapter 2: Data Handling using Pandas – I

Data Frames: Joining, Merging and Concatenations

Chapter 3: Data Handling using Pandas – II (FULL CHAPTER-DELETED)

Chapter 4: Plotting Data using Matplotlib

Purpose of Plotting; Drawing and Saving the following types of plots using Matplotlib

Pie chart, Frequency Polygon, Box Plot, and Scatter Plot.

Chapter 10: Deleted

Chapter 11: Deleted