BOARD OF SECONDARY EDUCATION RAJASTHAN, AJMER
Syllabus for Board Examination-2024
Class : XIIth
Sub. : Computer Science (03)

ईकाई संख्या व नाम	अध्याय संख्या व नाम	शीर्षक एवं विषय वस्तु	अंक भार
Unit I: Computational Thinking and Programming–2	Chapter 1 Exception Handling in Python Chapter 2 File Handling in Python Chapter 3 Stack Chapter 4 Queue Chapter 5 Sorting Chapter 6 Searching	• Revision of Python topics covered in Class XI. • Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope) • Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths • Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file • Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file • CSV file: import csv module, open / close csv file, write into a csv file using csv.writerow() and read from a csv file using csv.reader ( ) • Python libraries: creating python libraries • Recursion: simple programs with recursion: sum of first n natural numbers, factorial, fibonacci series • Idea of efficiency: number of comparisons in Best, Worst and Average case for linear search • Data Structure: Stack, operations on stack (push & pop), implementation of stack using list. Introduction to queue, operations on queue (enqueue, dequeue, is empty, peek, is full), implementation of queue using list.	32
Unit II: Computer Networks	Chapter 10 Computer Networks Chapter 11 Data Communication Chapter 12 Security Aspects	● Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET) ● Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching) ● Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves) ● Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card) ● Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree) ● Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP, wireless/mobile communication protocol such as	08

		GSM, GPRS and WLL ● Mobile telecommunication technologies: 1G, 2G, 3G, 4G and 5G ● Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting	
Unit III: Database Management	Chapter 7 Understanding Data Chapter 8 Database Concepts Chapter 9 Structured Query Language (SQL)	• Database concepts: introduction to database concepts and its need • Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key) • Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command, aggregate functions (max, min, avg, sum, count), group by, having clause, joins: cartesian product on two tables, equi-join and natural join • Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications	16

Practical

S.No.	Unit Name	Marks
1	**Lab Test:** Python program (60% logic + 20% documentation + 20% code quality)	7
2	**Lab Test:** 5 SQL Queries based on one/two table(s).	5
3	Report file: Minimum 20 Python programs. Out of this at least 5 programs should be based on SQL Queries and 2 programs based on Python-database connectivity.	7
4	Project (using concepts learnt in Classes 11 and 12	8
5	Viva voce	3
	Total	**30**

BOARD OF SECONDARY EDUCATION RAJASTHAN, AJMER
Syllabus for Board Examination-2024
Class : XIIth
Sub. : Informatic Practices (04)

इस विषय में दो प्रश्नपत्र–सैद्धान्तिक एवं प्रायोगिक की परीक्षा होगी। परीक्षार्थी को दोनों पत्रों में पृथक–पृथक उत्तीर्ण होना अनिवार्य है। परीक्षा योजना निम्नानुसार हैं –

प्रश्नपत्र	समय (घंटे)	प्रश्नपत्र के लिए अंक	सत्रांक	पूर्णांक
सैद्धान्तिक	3:15	56	14	70
प्रायोगिक	3:00	30	0	30

Unit Wise syllabus

ईकाई संख्या व नाम	अध्याय संख्या व नाम	शीर्षक एवं विषय वस्तु	अंक भार
Unit 1: Data Handling using Pandas and Data Visualization	Chapter 2 Data Handling using Pandas - I Chapter 3 Data Handling using Pandas - II Chapter 4 Plotting Data using Matplotlib	Data Handling using Pandas -I Introduction to Python libraries- Pandas, Matplotlib. Data structures in Pandas - Series and data frames. Series: Creation of series from ndarray, dictionary, scalar value; mathematical operations; series attributes, head and tail functions; selection, indexing and slicing. Data Frames: creation of data frames from dictionary of series, list of dictionaries, text/CSV files, display, iteration. Operations on rows and columns: add add (insert /append) , select, delete (drop column and row), rename, Head and Tail functions, indexing using labels, Boolean indexing; joining, merging and concatenation of data frames. Importing/Exporting Data between CSV files and Data Frames. (for practicals only) Data handling using Pandas – II Descriptive Statistics: max, min, count, sum, mean, median, mode, quartile, Standard deviation, variance. Data Frame operations: Aggregation, group by, Sorting, Deleting and Renaming Index, Pivoting. Handling missing values – dropping and filling. Importing/Exporting Data between MySQL database and Pandas. Data Visualization : Purpose of plotting, drawing and saving of plots using Matplotlib (line plot, bar graph, histogram, pie chart, frequency polygon, box plot and scatter plot). Customizing plots: color, style (dashed, dotted), width; adding label, title, and legend in plots.	24

Unit 2: Database Query using SQL	Chapter 1 Querying and SQL Functions	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 (Cartesian Join, Equi Join, Natural Join)	20
Unit 3: Introduction to Computer Networks	Chapter 5 Internet and Web	Introduction to networks, Types of network: 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, difference between a website and webpage, static vs dynamic web page, web server and hosting of a website. Web Browsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.	6
Unit 4: Societal Impacts	Chapter 6 Societal Impacts	Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act. E-waste: hazards and management. Awareness about health concerns related to the usage of technology	6

PRACTICAL

S.No.	Unit Name	Marks
1	Programs using Pandas and Matplotlib	8
2	SQL Queries	5
3	Practical file (minimum of 20 programs based on Pandas, 5 based on Matplotlib and 20 SQL queries must be included)	5
4	Project Work (using concepts learned in class XI and XII)	7
5	Viva-Voce	5
	Total	**30**

Prescribed Books : 1. Informatics Practices—NCERT's Book Published under Copyright