तत् त्वं पूषन् अपावृणु
केन्द्रीय विद्यालय संगठन

केन्द्रीय विद्यालय संगठन
अहमदाबाद संभाग

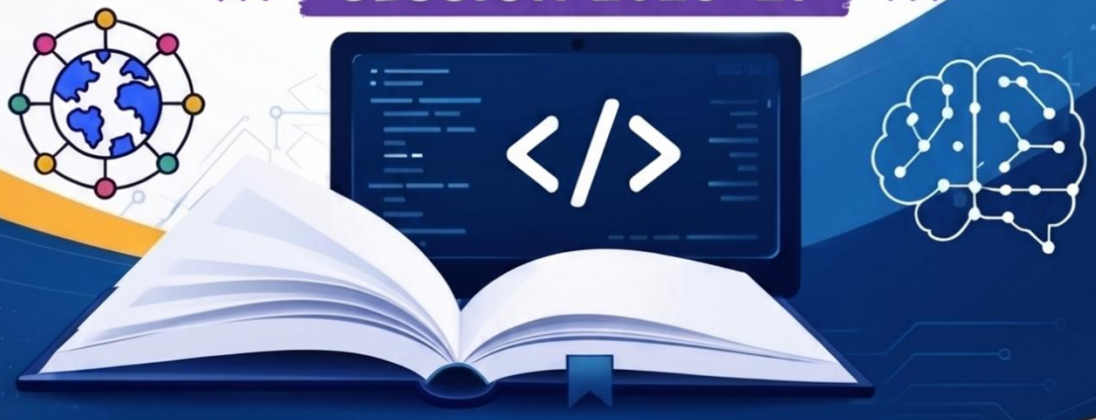
KENDRIYA VIDYALAYA SANGATHAN
AHMEDABAD REGION

QUESTION BANK

CLASS – XI

SUBJECT – COMPUTER SCIENCE (083)

SESSION 2026-27



THINK Creatively | CODE Confidently | SOLVE Smartly

हमारे संरक्षक / Our Patrons



श्री विकास गुप्ता, भा.प्र.से.
Sh. Vikas Gupta, IAS

आयुक्त / Commissioner

केंद्रीय विद्यालय संगठन, मुख्यालय (नई दिल्ली)
Kendriya Vidyalaya Sangathan, Head Quarter (New Delhi)



श्री धर्मेन्द्र पटले
Sh. Dharmendra Patle

उपायुक्त / Deputy Commissioner

केंद्रीय विद्यालय संगठन, क्षेत्रीय कार्यालय (अहमदाबाद)
Kendriya Vidyalaya Sangathan, Regional Office (Ahmedabad)



श्री वेंकटेश्वर प्रसाद बी.
Sh. Venkteswar Prasad B.

सहायक आयुक्त / Assistant Commissioner

केंद्रीय विद्यालय संगठन, क्षेत्रीय कार्यालय (अहमदाबाद)
Kendriya Vidyalaya Sangathan, Regional Office (Ahmedabad)



श्रीमती मीना जोशी
Smt. Meena Joshi

सहायक आयुक्त / Assistant Commissioner

केंद्रीय विद्यालय संगठन, क्षेत्रीय कार्यालय (अहमदाबाद)
Kendriya Vidyalaya Sangathan, Regional Office (Ahmedabad)



श्रीमती बिबियाना एक्का
Smt. Bibiyana Ekka

सहायक आयुक्त / Assistant Commissioner

केंद्रीय विद्यालय संगठन, क्षेत्रीय कार्यालय (अहमदाबाद)
Kendriya Vidyalaya Sangathan, Regional Office (Ahmedabad)



श्री देवेंद्र सिंह शेखावत
Sh. Devendra Singh Shekhawat

प्राचार्य / Principal

पीएम श्री केंद्रीय विद्यालय क्र. 3, वायु सेना स्थल-II, जामनगर
PM SHRI Kendriya Vidyalaya No.-3, AFS-II, Jamnagar

TEAM

Content Coordinator
Mr. Devendra Singh Shekhawat, Principal PM SHRI Kendriya Vidyalaya No. 3, Air Force Station-II, Jamnagar

Content Creation Team		
S. N.	**Name**	**Kendriya Vidyalaya**
1	Mr. Kashiram Bilhriya	Kendriya Vidyalaya No. 2, Kribhco, Surat
2	Mr. Bhuvnesh Jangid	Kendriya Vidyalaya No. 3, ONGC, Surat
3	Mr. Naveen Kumar Ghavari	Kendriya Vidyalaya, Patan
4	Mr. Jitendra Kantilal Varatiya	Kendriya Vidyalaya ONGC, Chandkheda

Content Review & Moderation Team		
S. N.	**Name**	**Kendriya Vidyalaya**
1	Mr. Kamlesh Amin	Kendriya Vidyalaya ONGC, Mehsana
2	Mr. Aakib Javed	PM SHRI Kendriya Vidyalaya Air Force Station, Naliya
3	Mrs. Priyanka Sangwan	Kendriya Vidyalaya, Diu

Syllabus

Unit I: Computer Systems and Organisation

- Basic computer organisation: Introduction to Computer System, hardware, software, input device, output device, CPU, memory (primary, cache and secondary), units of memory (bit, byte, KB, MB, GB, TB, PB).
- Types of software: System software (Operating systems, system utilities, device drivers), programming tools and language translators (assembler, compiler, and interpreter), application software.
- Operating System (OS): functions of the operating system, OS user interface.
- Boolean logic: NOT, AND, OR, NAND, NOR, XOR, truth tables and DeMorgan's laws, Logic circuits.
- Number System: Binary, Octal, Decimal and Hexadecimal number system; conversion between number systems.
- Encoding Schemes: ASCII, ISCII, and Unicode (UTF8, UTF32).

Unit II: Computational Thinking and Programming - I

- Introduction to Problem-solving: Steps for Problem-solving (Analysing the problem, developing an algorithm, coding, testing, and debugging), representation of algorithms using flowchart and pseudocode, decomposition.
- Familiarization with the basics of Python programming: Introduction to Python, Features of Python, executing a simple "hello world" program, execution modes: interactive mode and script mode, Python character set, Python tokens (keyword, identifier, literal, operator, punctuator), variables, concept of l-value and r-value, use of comments.
- Knowledge of data types: Number (integer, floating point, complex), boolean, sequence (string, list, tuple), None, Mapping(dictionary), mutable and immutable data types.
- Operators: arithmetic operators, relational operators, logical operators, assignment operators, augmented assignment operators, identity operators (is, is not), membership operators (in not in).

- Expressions, statement, type conversion, and input/output: precedence of operators, expression, evaluation of an expression, type-conversion (explicit and implicit conversion), accepting data as input from the console and displaying output.
- Errors- syntax errors, logical errors, and run-time errors.
- Flow of Control: introduction, use of indentation, sequential flow, conditional and iterative flow.
- Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number.
- Iterative Statement: for loop, range(), while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number, etc.
- Strings: introduction, string operations (concatenation, repetition, membership and slicing), traversing a string using loops, built-in functions/methods–len(), capitalize(), title(), lower(), upper(), count(), find(), index(), endswith(), startswith(), isalnum(), isalpha(), isdigit(), islower(), isupper(), isspace(),lstrip(), rstrip(), strip(), replace(), join(), partition(), split().
- Lists: introduction, indexing, list operations (concatenation, repetition, membership and slicing), traversing a list using loops, built-in functions/methods–len(), list(), append(), extend(), insert(), count(), index(), remove(), pop(), reverse(), sort(), sorted(), min(), max(), sum(); nested lists, suggested programs: finding the maximum, minimum, mean of numeric values stored in a list; linear search on list of numbers and counting the frequency of elements in a list.
- Tuples: introduction, indexing, tuple operations (concatenation, repetition, membership and slicing); built-in functions/methods – len(), tuple(), count(), index(), sorted(), min(), max(), sum(); tuple assignment, nested tuple; suggested programs: finding the minimum, maximum, mean of values stored

in a tuple; linear search on a tuple of numbers, counting the frequency of elements in a tuple.

- Dictionary: introduction, accessing items in a dictionary using keys, mutability of a dictionary (adding a new term, modifying an existing item), traversing a dictionary, built-in functions/methods – len(), dict(), keys(), values(), items(), get(), update(), del, clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), sorted(); Suggested programs: count the number of times a character appears in a given string using a dictionary, create a dictionary with names of employees, their salary and access them.
- Introduction to Python modules: Importing module using 'import <module>' and using from statement, importing math module (pi, e, sqrt(), ceil(), floor(), pow(), fabs(), sin(), cos(), tan()); random module (random(), randint(), randrange()), statistics module (mean(), median(), mode()).

Unit III: Society, Law and Ethics

- Digital Footprints
- Digital Society and Netizen: net etiquettes, communication etiquettes, social media etiquettes
- Data Protection: Intellectual property rights (copyright, patent, trademark), violation of IPR (plagiarism, copyright infringement, trademark infringement), open-source software and licensing (Creative Commons, GPL and Apache)
- Cyber Crime: definition, hacking, eavesdropping, phishing and fraud emails, ransomware, cyber trolls, cyber bullying.
- Cyber safety: safely browsing the web, identity protection, confidentiality
- Malware: viruses, trojans, adware
- E-waste management: proper disposal of used electronic gadgets.
- Information Technology Act (IT Act)
- Technology and society: Gender and disability issues while teaching and using computers

Distribution of Marks

Theory:

Unit No.	Unit Name	Marks
1	Computer Systems and Organisation	10
2	Computational Thinking and Programming -1	45
3	Society, Law, and Ethics	15
Total		70

Practical:

Unit No.	Unit Name	Marks
1	Lab Test: Python program (60% logic + 20% documentation + 20% code quality)	12
2	Report file: Minimum 20 Python programs	7
3	Viva voce	3
4	Project (that uses most of the concepts that have been learnt)	8
Total		30

Unit 01: Computer Systems and Organisation

Q. N.	Question
	Section A – Multiple Choice Questions
1	During a performance check, an IT technician compares access to frequently required data from RAM and cache memory. The technician finds that cache provides quicker access. Which feature of computer organisation best explains this observation? (a) Cache memory is faster than main memory and is placed closer to the CPU (b) Cache memory has greater capacity than secondary storage (c) Cache memory retains data permanently when power is switched off (d) Cache memory performs the functions of the operating system
2	A software developer tests two programs that use different language translators. In one case, the translator processes the source program statement by statement during execution. Which translator is being used? (a) Compiler (b) Assembler (c) Interpreter (d) Linker
3	An office is setting up a document-processing workstation. The system must first digitise printed forms, then allow the operator to view the processed information on screen, and finally produce a paper copy of selected records. Which sequence of devices is most appropriate for these three tasks? (a) Scanner → Monitor → Printer (b) Monitor → Scanner → Printer (c) Scanner → Printer → Monitor (d) Keyboard → Monitor → Scanner
4	During instruction execution, one component of the CPU interprets instructions and directs other components about the operations to be performed. Which component performs this coordinating role? (a) ALU (b) CU (c) Cache (d) RAM

5	A printer works correctly from its own control panel, but the operating system cannot communicate with it. An IT support technician suspects that the software required to allow the OS to communicate with the printer is missing. What should the technician check? (a) Application software (b) Programming language (c) Cache memory (d) Device driver
6	A data storage system has a capacity of 1 PB. What is its capacity in Megabits? (a) 2^{30} Mb (b) 2^{33} Mb (c) 2^{40} Mb (d) 2^{43} Mb
7	While several programs are running, the operating system decides which process gets CPU time and manages their execution. Which OS function is being performed? (a) File management (b) Device management (c) Memory management (d) Process management
8	During routine maintenance, a lab technician uses a program to remove unnecessary files and perform other housekeeping tasks on a computer. How should this program be classified? (a) Application software (b) Utility software (c) Assembly language (d) Device hardware
9	An embedded system repeatedly performs addition, subtraction, comparisons and logical operations on data. Which CPU component is primarily responsible for these operations? (a) Control Unit (b) Cache Memory (c) ALU (d) Operating System
10	An engineer examines a digital circuit and finds that the entire circuit has been constructed using only one type of gate. Which of the following gates could be used for such a design? (a) NAND (b) OR (c) AND (d) XOR

11	A safety controller should produce output 1 only when exactly one of two independent switches is active. Which gate provides this behaviour? (a) AND (b) OR (c) XOR (d) NOR
12	While evaluating a Boolean expression, an engineer needs to simplify the complement (logical opposite) of A + B. Which of the following expressions is equivalent to it? (a) A' + B' (b) A' · B' (c) A · B (d) A + B
13	An engineer is testing a two-stage digital control circuit. The first stage produces X = A NAND B and the second stage produces Y = X · (A + B) For A = 1 and B = 0, what will be the value of Y? (a) 0 (b) 2 (c) 1 (d) Cannot be determined
14	A programmer needs to store the decimal number 157 in binary. Using the repeated-division-by-2 method, which binary representation is obtained? (a) 10011001 (b) 10101101 (c) 11001101 (d) 10011101
15	A data-entry system uses standard ASCII codes. If uppercase 'A' has code 65 and the code increases by one for each successive uppercase letter, which binary code represents uppercase 'E'? (a) 01000011 (b) 01000100 (c) 01000101 (d) 01000110
16	A logic designer checks the Boolean identity A(B + C) = AB + AC for all possible values of A, B and C. Which Boolean law is being verified? (a) Distributive law (b) Absorption law (c) Associative law (d) Complement law

17	A legacy system reserves exactly 7 bits for each ASCII character. How many different bit patterns can it represent? (a) 64 (b) 96 (c) 256 (d) 128
18	A web application is expected to contain a large amount of ordinary English text as well as characters from other languages. Which encoding is generally more space-efficient for the ASCII-range English text while still supporting Unicode characters? (a) UTF-8 (b) UTF-32 (c) ISCII (d) Standard ASCII only
19	A legacy database stores text from several Indian scripts using ISCII. The organisation now wants an encoding standard capable of representing a much wider range of writing systems. Which option is the most appropriate direction? (a) ASCII (b) Binary (c) ISCII (d) Unicode
20	A software architect wants a Unicode encoding in which each code unit has a fixed size of 4 bytes. Which encoding matches this requirement? (a) UTF-8 (b) UTF-32 (c) ISCII (d) ASCII
Section B – Fill in the Blanks	
21	An interface designer wants users to interact with a computer through windows, icons, menus and a pointer rather than by entering commands. This type of interface is called a _____.
22	A programmer is working with a source program written in assembly language. The translator required to convert its instructions into machine language is called an _____.
23	A technician records the output of a logic circuit for every possible combination of its input values. This complete tabular representation is called a _____.

24	A data analyst checks the decimal value represented by the binary number $(0101011101)_2$. The value is _____.
25	The smallest unit of data in a computer that can represent either 0 or 1 is called a _____.
Section C – True or False	
26	An operating system may manage CPU scheduling, memory and files while application programs are running.
27	The hexadecimal number $(2E)_{16}$ is equal to the decimal number 47.
28	A logic-circuit tester is told that a truth table for four Boolean input variables requires only 8 rows.
29	While documenting a digital system, an engineer records that the octal number system uses eight distinct digits, from 0 to 7.
30	A technician observes that data stored in RAM is lost when the computer is switched off.
Section D – Assertion and Reason	
	Directions: In the following questions, a statement of Assertion (A) is given followed by a corresponding statement of Reason (R). Choose the correct option out of the given options. (a) Both A and R are true and R is the correct explanation of A. (b) Both A and R are true but R is not the correct explanation of A. (c) A is true but R is false. (d) A is false but R is true.
31	Assertion (A): Solid State Drives (SSDs) have significantly lower random access times than traditional Hard Disk Drives (HDDs). Reason (R): HDDs rely on physical read/write heads moving across spinning magnetic platters, incurring rotational latency and seek time.
32	Assertion (A): An application software program can take over the role of the operating system in managing hardware resources and providing the basic user–hardware interface.

	Reason (R): The operating system manages system resources and provides an interface through which users and application programs interact with the computer.
33	Assertion (A): An interpreter is useful when errors need to be identified during the execution of a program. Reason (R): A compiler translates the complete program before execution.
34	Assertion (A): The binary number $(101101)_2$ and the hexadecimal number $(2D)_{16}$ represent the same value. Reason (R): The hexadecimal number system uses the symbols 0–9 and A–F.
35	Assertion (A): The Boolean expression A + A·B can be simplified to A without changing its output. Reason (R): The Boolean identity A + B = B + A is the commutative law.
36	Assertion (A): A truth table for a circuit with four binary inputs requires 16 rows. Reason (R): A truth table contains one row for each possible combination of input values.
37	Assertion (A): Hexadecimal notation can represent a long binary pattern using fewer written digits. Reason (R): The hexadecimal number system uses the symbols 1–9 and A–G.
38	Assertion (A): A touchscreen is only an output device. Reason (R): A touchscreen can display information and also detect touch-based commands.
39	Assertion (A): RAM is suitable for storing data that a running program is currently using, but its contents are not retained after power is removed. Reason (R): RAM is a form of secondary storage used for long-term storage of data and programs.

40	Assertion (A): The output of a NOR gate is 0 when either of its inputs is 1. Reason (R): An OR gate produces 0 only when both of its inputs are 0.
Section E – Competency-Based / Case-Based Questions	
41	A computer system consists of a CPU, cache memory, RAM, and an SSD. The CPU needs to access a particular piece of data, but the data is not currently available in the cache. Explain the sequence of memory accesses that takes place to provide the required data to the CPU. Include what happens when the data is found in RAM and what happens when it is not found in RAM.
42	A digital control system is designed to activate an output based on several input conditions represented by the Boolean variables A, B, C, and D. The system follows the Boolean expression: F = (A.B')+(C+D')+B.D' Draw the Logic Circuit and Truth Table that implements the given Boolean expression.
43	A smart classroom is equipped with an automated projector control system. The system has three inputs: • A = Teacher enters the classroom • B = Classroom is occupied • C = Manual switch is ON The projector (Y) turns ON when the teacher enters the classroom and the classroom is occupied, or when the manual switch is ON. Based on the above scenario, answer the following: (a) Write the Boolean expression for the projector output Y. (b) Identify the logic gates required to implement the Boolean expression. (c) Prepare the complete truth table for the given logic circuit. (d) Determine the output of the projector when A=1, B=0, and C=1.

44	Rishit has installed an operating system that initially requires commands to be entered at a prompt. He later switches to an interface based on windows, icons and menus. Answer the following: (a) Identify the two types of user interface involved. (b) State one difference between them. (c) Explain why the second interface may be easier for a new user. (d) Give one example of each type.
45	A software development team is preparing a program written in a high-level programming language for deployment on a computer system. During development, the programmer wants errors to be reported as soon as individual statements are processed. However, before final deployment, the team wants to translate the complete program into machine code so that it can be executed efficiently without translating each statement every time it runs. Answer the following: (a) Which language translator would be more suitable during the development/testing stage? Give a reason. (b) Which language translator would be more suitable for preparing the final executable program? (c) How does the working approach of these two translators differ? (d) A separate program contains instructions written in assembly language. Which language translator would be required to convert those instructions into machine language?

Answer Key

Q. N.	Answer	Q. N.	Answer
1	(a)	21	GUI
2	(c)	22	assembler

3	(a)	23	truth table
4	(b)	24	349
5	(d)	25	Bit
6	(b)	26	True
7	(d)	27	False
8	(b)	28	False
9	(c)	29	True
10	(a)	30	True
11	(c)	31	(a)
12	(b)	32	(d)
13	(c)	33	(b)
14	(d)	34	(b)
15	(c)	35	(b)
16	(a)	36	(a)
17	(d)	37	(c)
18	(a)	38	(d)
19	(d)	39	(c)
20	(b)	40	(a)

- Answer 41

  When the CPU requires data, the following sequence occurs:

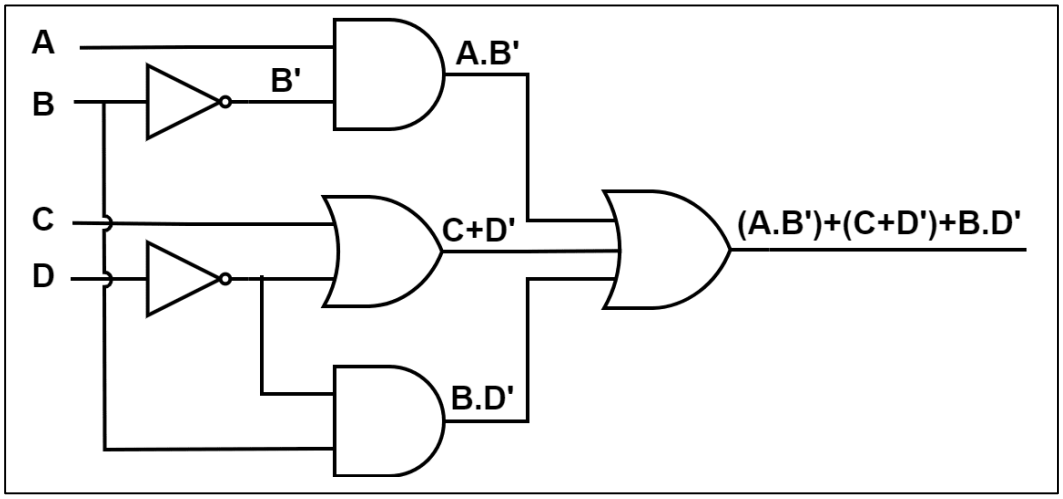
  - Cache check: The CPU first checks the cache memory for the required data.
  - Cache miss: If the data is not found in the cache, a cache miss occurs, and the system checks RAM.
  - Data found in RAM: If the data is available in RAM, it is retrieved and may be placed in the cache before being supplied to the CPU.
  - Data not found in RAM: If the required data is not available in RAM, it must be retrieved from secondary storage, such as an SSD.

- Data transfer: The data retrieved from the SSD is loaded into RAM and then made available to the CPU, typically with the relevant data also being cached for future access.

This memory hierarchy improves system performance because frequently accessed data can be stored in faster memory while larger amounts of data can be retained in slower, higher-capacity storage.

- Answer 42

Logic Circuit:



Truth-Table:

A	B	C	D	F
0	0	0	0	**1**
0	0	0	1	**0**
0	0	1	0	**1**
0	0	1	1	**1**
0	1	0	0	**1**
0	1	0	1	**0**
0	1	1	0	**1**
0	1	1	1	**1**

A	B	C	D	F
1	0	0	0	**1**
1	0	0	1	**1**
1	0	1	0	**1**
1	0	1	1	**1**
1	1	0	0	**1**
1	1	0	1	**0**
1	1	1	0	**1**
1	1	1	1	**1**

- Answer 43

(a) The projector turns ON when A AND B are true, or when C is true.

Y = (A.B) + C

(b) Logic Gates Required

- One AND gate – to perform A·B
- One OR gate – to combine A·B with C

(c) Truth Table

A	B	C	A.B	Y
0	0	0	0	0
0	0	1	0	1
0	1	0	0	0
0	1	1	0	1
1	0	0	0	0
1	0	1	0	1
1	1	0	1	1
1	1	1	1	1

(d) Output for A = 1, B = 0, C = 1

Y = 1 (Therefore, the projector turns ON)

- Answer 44

(a) First interface: Command-Line Interface (CLI)

Second interface: Graphical User Interface (GUI).

(b) CLI: Users interact by manually typing text-based commands using a keyboard.

GUI: Users interact visually by pointing and clicking on graphic elements (icons, menus, windows) using a mouse or touchscreen.

(c) A Graphical User Interface is much easier for beginners because it relies on visual recognition rather than recall. Users do not need to memorize complex commands or syntax; options are displayed clearly through intuitive icons and drop-down menus. Additionally, immediate visual feedback and built-in error prevention make navigation more intuitive and less prone to syntax errors.

(d) CLI Example: MS-DOS (or Windows Command Prompt / Linux Bash)

GUI Example: Microsoft Windows 11 (or macOS / Ubuntu Desktop)

- Answer 45

(a) Interpreter, because it translates and executes the program statement by statement, allowing errors to be identified during processing.

(b) Compiler, because it translates the complete source program into machine code before execution.

(c) An interpreter translates and executes statements one by one, whereas a compiler translates the complete program before execution.

(d) Assembler.

Unit 02: Computational Thinking and Programming - I

Q. N.	Question
	Section A – Multiple Choice Questions
1	An IT technician is handed a large task: read attendance data, validate entries, calculate summaries, and generate a report. The technician first draws four smaller tasks and decides what each task should receive and return. Before writing any Python, which design decision has most directly reduced the complexity of the original problem? (a) Replacing testing with debugging (b) Using an iterative statement (c) Converting all data to strings (d) Applying decomposition
2	A developer writes the following before deciding the Python syntax: READ temperature IF temperature > 35 DISPLAY "High" ELSE DISPLAY "Normal" Which advantage is the developer gaining at this stage? (a) The logic can be examined independently of Python syntax (b) The representation can be executed by Python directly (c) All runtime errors are automatically removed (d) The representation guarantees that the final program is logically correct
3	A program contains `total = price + tax`. During code review, a trainee says that `total` is being used as a value and `price` is the storage location. Which correction should the reviewer make? (a) `total` is the l-value while `price` contributes an r-value (b) `price` is the l-value and `total` is the r-value (c) Both are storage locations (d) Neither has an l-value/r-value role

4	A billing program displays an error when it reaches `amount = quantity * 45`. Investigation shows that the operator entered `3` at an earlier `input()` statement. The value looked numeric on screen. What is the most likely correction? (a) quantity = bool(input()) (b) quantity = str(input()) (c) quantity = complex(input()) (d) quantity = int(input())
5	A reviewer finds this expression in a tax-calculation program: x = 20 + 18 // 5 * 2 - 4 Without running the program, what value should the reviewer record? (a) 23 (b) 28 (c) 24 (d) 22
6	Two separately created lists contain the same values. A programmer wants to know whether the two variables point to the very same list object. Which test answers that question rather than merely comparing contents? (a) p == q (b) p = q (c) p in q (d) p is q
7	A program passes syntax checking and begins execution. It fails only when `records[5]` is accessed, although `records` contains only five elements. Which classification best fits the failure? (a) Syntax error (b) Logical error (c) Tokenisation error (d) Runtime error
8	A school system must classify a person aged exactly 18 as eligible. The existing condition is `if age > 18:`. The program runs normally but rejects an 18-year-old. What kind of correction is required? (a) Replace > with >= (b) Replace if with while (c) Convert age to string (d) Add a second print statement
9	A loop is intended to process 10, 8, 6 and 4, but never 2. Which existing loop already has exactly that behaviour? (a) for k in range(10,2,-2): (b) for k in range(10,2,2): (c) for k in range(10,4,-2): (d) for k in range(2,10,-2):

10	A test engineer observes that a counter increases once for every combination of an outer loop running 3 times and an inner loop running 2 times. Which final counter value should appear if it starts at zero? (a) 6 (b) 5 (c) 8 (d) 9
11	A linear search is scanning a list. Once the first matching ID is found, processing the remaining elements is unnecessary. Which statement should the programmer use at that point? (a) continue (b) break (c) in (d) pass
12	A log analyser uses `s = "COMPUTATION"` and needs every second character beginning with the third character, stopping before index 8. Which result should it obtain? (a) CTA (b) OMT (c) MUA (d) MPU
13	A validation routine must report the position of a required character, but the programmer deliberately wants an exception when the character does not exist so that the missing-data condition is noticed. Which method fits? (a) find() (b) count() (c) index() (d) startswith()
14	A technician creates `backup = original` for a list and later changes one element through `backup`. During testing, the same element in `original` also changes. What does this observation reveal? (a) Lists are immutable (b) Both names refer to the same list object (c) Python automatically copied the list (d) Assignment converted the list to a tuple
15	A data analyst stores the following records as a nested list: data = [[10, 20], [30, 40]] Which expression accesses the value 40?

	(a) data[0][1] (b) data[1][1] (c) data[1][0] (d) data[0][0]
16	A developer wants to exchange the contents of `x` and `y`. The code must not use a temporary variable. Which line achieves the intended exchange? (a) x = y; y = x (b) x == y (c) x, y = y, x (d) x + y = y + x
17	A character-frequency program must work even when the current character has never appeared before. Which line is the most robust way to update the count? (a) freq[ch] = freq[ch] – 1 (b) freq[ch] = 1 (c) freq[ch] = freq.get(ch,0) + 1 (d) freq.add(ch)
18	A programmer wants to add the key "status" with the value "active" only if the key is not already present in dictionary user. Which statement is most suitable? (a) user.get("status", "active") (b) user.setdefault("status", "active") (c) user.pop("status", "active") (d) user.clear("status", "active")
19	A programmer needs only `sqrt` and `pi` from the math module and does not want to refer to them as `math.sqrt` and `math.pi` later. Which import best matches that intention? (a) import math (b) import sqrt, pi (c) from math import sqrt, pi (d) from sqrt import math
20	A simulation must generate one of the integers 2, 3, 4, 5, 6 or 7. Which expression has the required boundary behaviour? (a) random.randrange(2,7) (b) random.randint(2,7) (c) random.randint(2,8) (d) random.random(2,8)
Section B – Fill in the Blanks	
21	A programmer tests a program, identifies an error, changes the code, and tests again. The activity of locating and correcting the error is called _____.

22	A user enters `48` through `input()`. Before arithmetic can treat it as a whole number, the returned value normally needs explicit _____.
23	In `range(2, 10, 3)`, the value 10 does not appear because the _____ boundary is excluded.
24	A dictionary-based report needs both the key and its corresponding value during traversal. The method most directly suited is _____.
25	A collection must be protected from accidental element reassignment. Choosing a tuple provides this property because a tuple is _____.
Section C – True or False	
26	A programmer can change an individual character of a string using an assignment such as `s[0]='A'`.
27	If two list variables refer to the same list object, changing the list through one variable can be observed through the other.
28	The condition in a while loop is checked before each iteration of its body.
29	Using `break` inside a nested loop necessarily terminates every surrounding loop as well.
30	The expression `key in d` checks membership of keys when d is a dictionary.
Section D – Assertion and Reason	
	Directions: In the following questions, a statement of Assertion (A) is given followed by a corresponding statement of Reason (R). Choose the correct option out of the given options. (a) Both A and R are True and R is the correct explanation of A. (b) Both A and R are True but R is not the correct explanation of A. (c) A is true but R is False. (d) A is false but R is True.
31	Assertion (A): Strings are immutable in Python. Reason (R): An individual character of a string can be replaced using index assignment

32	Assertion (A): A list can be modified after it has been created. Reason (R): A tuple cannot be modified after it has been created.
33	Assertion (A): An element of a tuple can be replaced by index assignment. Reason (R): Tuples are immutable sequences.
34	Assertion (A): Using `sorted(L)` is appropriate when a programmer needs a sorted result but must preserve L. Reason (R): `L.sort()` changes L in place.
35	Assertion (A): A `continue` statement is suitable when the current iteration should be abandoned but later iterations should still be considered. Reason (R): `continue` skips the remaining statements of the current iteration and proceeds with the next iteration.
36	Assertion (A): A dictionary is useful for character-frequency counting. Reason (R): Dictionaries are mutable data types in Python.
37	Assertion (A): `10 / 4` evaluates to a floating-point value in Python. Reason (R): The `/` operator performs floor division.
38	Assertion (A): `==` is the appropriate operator when two values need to be compared for equality. Reason (R): `is` checks whether two references denote the same object.
39	Assertion (A): A tuple element can be replaced using index assignment if the new value has the same data type as the old value. Reason (R): Tuples are immutable sequences.
40	Assertion (A): A while loop may execute zero times. Reason (R): Its condition is tested before the loop body is executed.
Section E – Competency-Based / Case-Based Questions	
41	A school office stores monthly power readings as: readings = [18, 21, 17, 25, 21, 19] The officer wants to prepare a report but must retain the original sequence for later use.

	(a) Without manually comparing every element, obtain the highest reading. (b) Compute the average. (c) Produce a sorted version for display while preserving `readings`. (d) The officer accidentally uses `readings.sort()`. Predict what happens to the stored order and identify the safer alternative.
42	A software tester receives a single string: raw = " Admin01,Guest_2,Operator3 " The test must be performed in stages rather than by manually writing the three usernames. (a) Remove unwanted spaces at both ends. (b) Turn the remaining text into separate usernames. (c) Verify whether the first username begins with `Admin`. (d) Produce one display string in which usernames are separated by |.
43	A library keeps the number of issued books in: issued = {"Python": 12, "SQL": 8, "AI": 15} The librarian wants the program to handle new titles and missing searches gracefully. (a) Add `Networks` with count 6. (b) Increase the Python count by 3. (c) Display every title together with its count. (d) Ask for the count of `Cloud`, returning 0 if it is not present.

44	A developer is reviewing below code:
	total = 0
	for n in range(1, 8):
	  if n % 2 == 0:
	  continue
	  total += n
	  if total > 8:
	  break
	The developer is asked to predict behaviour without executing it.

	(a) Which values of n actually reach `total += n`? (b) What is total when the loop stops? (c) Why do even values not reach the addition statement? (d) What event causes the loop to terminate?
45	A data manager wants to count how many times each character appears in the following string: text = "LEVEL" The dictionary freq is initially empty. Answer the following: (a) Write the statement to increase the count of a character ch by 1. If ch is not already in the dictionary, its count should start from 0. (b) After processing the string, what will be the frequency of L, E and V? (c) Which dictionary method can be used to display each character along with its frequency? (d) Why is a dictionary suitable for storing the character frequencies?

Answer Key

Q. N.	Answer	Q. N.	Answer
1	(d)	21	debugging
2	(a)	22	type conversion
3	(a)	23	stop
4	(d)	24	items()
5	(d)	25	immutable
6	(d)	26	False
7	(d)	27	True
8	(a)	28	True
9	(a)	29	False
10	(a)	30	True

11	(b)	31	(c)
12	(c)	32	(b)
13	(c)	33	(d)
14	(b)	34	(a)
15	(b)	35	(a)
16	(c)	36	(b)
17	(c)	37	(c)
18	(b)	38	(b)
19	(c)	39	(d)
20	(b)	40	(a)

- Answer 41

(a) highest = max(readings)
print(highest)

⇨ The max() function can be used to find the highest value directly, without manually comparing each element.

(b) average = sum(readings) / len(readings)
print(average)

⇨ The average can be calculated using the sum() and len() functions.

(c) sorted_readings = sorted(readings)
print(sorted_readings)
print(readings)

⇨ The sorted() function creates a new sorted list and does not change the original list.

(d) readings.sort()

⇨ The sort() method sorts the same list in place. It changes the original list.

- Answer 42

(a) raw = raw.strip()
print(raw)

⇨ The strip() method removes unwanted spaces from both ends of the string.

(b) usernames = raw.split(",")
print(usernames)

⇨ The split() method separates the usernames wherever a comma occurs.

(c) print(usernames[0].startswith("Admin"))

⇨ The startswith() method checks whether the first username begins with "Admin".

(d) display = "|".join(usernames)
print(display)

⇨ The join() method combines the usernames into a single string using | as the separator.

- Answer 43

(a) issued["Networks"] = 6

⇨ A new key "Networks" is added to the dictionary with a count of 6

(b) issued["Python"] = issued["Python"] + 3

⇨ The existing count of "Python" is increased by 3

(c) for title, count in issued.items():
print(title, count)

⇨ The items() method returns each title along with its count.

(d) print(issued.get("Cloud", 0))

⇨ The get() method returns the count of "Cloud". If "Cloud" is not present, it returns 0.

- Answer 44

(a) The values that reach the addition statement are 1, 3, and 5.

⇨ The value 7 is part of the range, but the loop terminates early before n reaches 7.

(b) The final value of total is 9.

(c) Even numbers trigger the if n % 2 == 0: condition, which executes a continue statement. This immediately skips the rest of the current iteration and jumps straight to the next loop cycle without executing total += n.

(d) The loop terminates due to the break statement being triggered when total > 8. This happens during the iteration where n = 5, because total becomes 9, satisfying the condition total > 8.

- Answer 45

(a) freq[ch] = freq.get(ch, 0) + 1

⇨ freq.get(ch, 0) looks up ch in the dictionary. If it exists, it returns its current count; if not, it defaults to 0. Then, + 1 increments it, and the result is assigned back to freq[ch].

(b) After processing the entire string "LEVEL", the frequencies will be:

L: 2
E: 2
V: 1

(c) for char, count in freq.items():
print(char, count)

⇨ The .items() method can be used to display each character along with its frequency. It returns a view object displaying a list of a dictionary's key-value tuple pairs.

(d) A dictionary is suitable for storing character frequencies because each unique character can be stored as a key and its frequency as the corresponding value. This makes it easy to access and update the count of each character.

Unit 03: Society, Law and Ethics

Q. N.	Question
Section A – Multiple Choice Questions	
1	A user regularly uses social media, searches for information, and uploads photographs. These online activities leave behind a record of the user's interaction with the digital world. What is this record called? (a) Digital footprint (b) Digital identity (c) User profile (d) Online authentication
2	A social-media platform records a user's login time, IP address and browser information automatically. The same user also deliberately posts a photograph and writes a comment. Which statement correctly classifies these activities? (a) Both activities create active digital footprints. (b) The login and browsing information forms a passive digital footprint, while the post and comment form an active digital footprint. (c) The login information forms an active digital footprint, while the post and comment form a passive digital footprint. (d) Neither activity contributes to a digital footprint.
3	A student is participating in an online discussion and wants to behave as a responsible netizen. A responsible netizen should: (a) Share information without checking its authenticity (b) Use offensive language during online discussions (c) Respect others and follow responsible online practices (d) Share other people's personal information
4	Aman disagrees with another person's opinion in an online discussion. Which response shows appropriate online communication etiquette? (a) Using offensive words to express disagreement (b) Posting the same message repeatedly (c) Sharing the person's private information (d) Expressing disagreement respectfully

5	In a school discussion forum, a user repeatedly posts deliberately provocative comments, changes the topic to create arguments, and continues doing so even after other users request the discussion to stop. Which behaviour is best described by this situation? (a) Phishing (b) Eavesdropping (c) Cyber bullying (d) Cyber trolling
6	A start-up has developed a new mechanical device, registered a distinctive name and logo for its product, and produced an original promotional video. Which sequence of IPRs is most appropriate for these three creations respectively? (a) Patent, Trademark, Copyright (b) Copyright, Patent, Trademark (c) Trademark, Copyright, Patent (d) Patent, Copyright, Trademark
7	A software developer plans to use an open-source library in a project and later distribute a modified version of the software. Before doing so, what should the developer check first? (a) The size of the library (b) The licence terms of the library (c) The screen resolution of the computer (d) The programming language used to create the library
8	A company creates a new logo for its product and also writes original software for managing the product. Which pair of IPRs is relevant to protecting these two creations respectively? (a) Trademark and Patent (b) Copyright and Patent (c) Patent and Trademark (d) Trademark and Copyright
9	A user repeatedly sends insulting and threatening messages to another person through a social-media platform. This behaviour is best described as: (a) Phishing (b) Eavesdropping (c) Cyber trolling (d) Cyber bullying
10	A student uses copyrighted material without appropriate permission. Which of the following is an example of copyright infringement? (a) Creating an original drawing

	(b) Citing the source of a published article (c) Using copyrighted material without appropriate permission (d) Creating one's own original software
11	Which of the following best describes open-source software? (a) Software whose source code is made available under specified licence terms (b) Software that cannot be modified under any circumstances (c) Software that is always illegal to copy (d) Software that cannot be redistributed
12	A software developer wants to release a program so that others can use, modify and redistribute it, while requiring distributed modified versions to remain under the same licence. Which licence is most appropriate? (a) Creative Commons (b) GPL (c) Apache Licence (d) Trademark
13	A network administrator notices that someone is secretly monitoring messages exchanged between two users without their knowledge or permission. Which activity does this situation describe? (a) Plagiarism (b) Authentication (c) Eavesdropping (d) Netiquette
14	A customer receives an email that appears to be from a bank. It asks the customer to click a link and enter account credentials to "verify" the account. What type of cyber threat should the customer suspect? (a) E-waste (b) Copyright infringement (c) Phishing (d) Open-source software
15	Which cyber-crime involves malicious software that can restrict access to data and demand payment? (a) Eavesdropping (b) Cyber trolling (c) Plagiarism (d) Ransomware
16	A student is browsing the Internet and receives a link from an unknown source. Which of the following is the safest practice while browsing the

	Internet? (a) Clicking links received from unknown sources (b) Verifying suspicious links and websites before using them (c) Downloading software from unverified websites (d) Sharing passwords with trusted friends
17	After installing a seemingly useful free application, several computers in a laboratory begin displaying frequent unwanted advertisements. No files are encrypted and the program does not demand payment. Which type of malware is most consistent with this behaviour? (a) Adware (b) Trojan (c) Virus (d) Ransomware
18	A technician finds that a program was installed after appearing to be a useful and legitimate application, but it later performed a harmful action on the computer. Which type of malware could explain this behaviour? (a) Adware (b) Trojan (c) Virus (d) Ransomware
19	A school has an obsolete electronic device that is no longer required. What is the most appropriate method of disposing of an obsolete electronic device? (a) Throwing it into an ordinary garbage bin (b) Burning it in an open area (c) Giving it to an authorised e-waste collection/recycling facility (d) Leaving it in a public place
20	A school provides suitable accessibility features so that students with disabilities can participate in computer education. Which of the following promotes inclusive use of technology? (a) Providing equal access and suitable accessibility features (b) Restricting computer education based on gender (c) Designing technology without considering disability (d) Assuming that certain computer activities are suitable only for particular genders

Section B – Fill in the Blanks	
21	The set of guidelines that promotes respectful and responsible behaviour while communicating online is called _____.
22	Protecting personal or sensitive information from unauthorised access is known as _____.
23	A fraudulent attempt to obtain sensitive information by pretending to be a trustworthy person or organisation is known as _____.
24	Malware that can replicate itself and spread by infecting files or programs is commonly known as a _____.
25	Protecting a person's personal details and account credentials while using digital services is called _____.
Section C – True or False	
26	The Apache Licence is one of the licences associated with open-source software.
27	A responsible netizen should share unverified information as quickly as possible.
28	Creative Commons provides licensing options that can specify how a creator's work may be used by others.
29	Confidential information should be protected from unauthorised access.
30	Cyber bullying can occur only when people are physically present together and cannot occur through digital platforms.
Section D – Assertion and Reason	
	Directions: In the following questions, a statement of Assertion (A) is given followed by a corresponding statement of Reason (R). Choose the correct option out of the given options. (a) Both A and R are true and R is the correct explanation of A. (b) Both A and R are true but R is not the correct explanation of A. (c) A is true but R is false. (d) A is false but R is true.
31	Assertion (A): A person should think carefully before posting information on social media.

	Reason (R): Information shared online can contribute to the person's digital footprint.
32	Assertion (A): A person's digital footprint can affect their online reputation. Reason (R): Using strong, unique passwords helps protect online accounts.
33	Assertion (A): Copying another person's work and presenting it as one's own is plagiarism. Reason (R): Copyright provides protection to original creative works.
34	Assertion (A): A patent and a trademark provide exactly the same type of intellectual property protection. Reason (R): A patent is associated with an invention, whereas a trademark can identify goods or services.
35	Assertion (A): A user should be cautious when receiving emails requesting confidential information. Reason (R): Phishing emails may attempt to trick users into revealing sensitive information.
36	Assertion (A): Open-source software can have conditions on how it is modified or redistributed. Reason (R): Open-source software makes its source code available to users.
37	Assertion (A): Users should avoid installing software from unknown and untrusted sources. Reason (R): Such software cannot contain malware.
38	Assertion (A): Proper e-waste management is not important for society. Reason (R): Discarded electronic devices can contain materials that may cause environmental harm if improperly handled.
39	Assertion (A): Computer education should provide equal opportunities to students irrespective of gender. Reason (R): Gender stereotypes never create barriers to participation in technology-related learning.

40	Assertion (A): Accessibility features can help people with disabilities use computers and digital resources. Reason (R): Different users may require different ways of interacting with digital technology.
Section E – Competency-Based / Case-Based Questions	
41	During a school cyber-awareness activity, a student discovers that an unknown person has gained access to a classmate's account by trying to guess the password. The person then reads private messages without permission. (a) Which cyber-crime is primarily involved in gaining unauthorised access? (b) Which cyber-safety principle is violated when private messages are read? (c) State two measures the account holder could have used to reduce the risk.
42	The computer laboratory of a school is affected by a malware attack. Files containing project work suddenly become inaccessible and a message appears demanding payment in exchange for restoring access. The lab assistant had recently opened an attachment received from an unknown sender. (a) Identify the type of malware/cyber-attack indicated by the situation. (b) Suggest two safe practices that could have reduced the risk. (c) Why is paying an unknown attacker not a dependable solution?
43	A school introduces an online learning portal. A teacher notices that some students with different physical abilities cannot comfortably use certain controls, while some students hesitate to participate because examples and classroom roles are repeatedly presented using gender stereotypes. Based on the situation: (a) Identify the two technology-and-society issues involved;

	(b) Explain how inclusive design and classroom practices can improve participation; (c) Give one example of an accessibility feature that can help a learner.
44	A school is replacing 25 old computers. The disposal team suggests two options: ▪ Send the computers through an authorised e-waste collection/recycling channel, or ▪ Treat them as ordinary household waste after removing their hard drives. The school must decide how the computers should be disposed of. (a) What factors should the school consider while choosing between the two options? (b) Explain why improper disposal of electronic devices can be harmful to the environment. (c) Why does removing the hard drive not make the remaining computer ordinary household waste?
45	A student development team is creating an educational mobile application. The team plans to: ▪ Use an existing open-source software library ▪ Include an image created by another person ▪ Use a registered brand name in the application's promotional material ▪ Collect users' names and contact details for account creation. Before releasing the application, the team reviews the legal and ethical implications. Answer the following: (a) What should the team check before using and modifying the open-source software library? (b) Which IPR should be considered before using the image created by another person? (c) Which IPR is associated with the registered brand name?

	(d) Why should the team consider the Information Technology Act while developing an application that collects and processes user information? (e) State one responsible practice for protecting the users' information.

Answer Key

Q. N.	Answer	Q. N.	Answer
1	(a)	21	Netiquette
2	(b)	22	Confidentiality
3	(c)	23	Phishing
4	(d)	24	Virus
5	(d)	25	Identity protection
6	(a)	26	True
7	(b)	27	False
8	(d)	28	True
9	(d)	29	True
10	(c)	30	False
11	(a)	31	(a)
12	(b)	32	(b)
13	(c)	33	(b)
14	(c)	34	(d)
15	(d)	35	(a)
16	(b)	36	(b)
17	(a)	37	(c)
18	(b)	38	(d)
19	(c)	39	(c)
20	(a)	40	(a)

- Answer 41
  (a) The cyber-crime is unauthorised access (hacking).

  (b) The cyber-safety principle violated is privacy.

  (c) Two measures are:

    - Use a strong, unique password that is difficult to guess.
    - Enable two-factor authentication (2FA) for the account.

- Answer 42
  (a) The attack is ransomware, a type of malware that locks or encrypts files and demands payment to restore access.

  (b) Two safe practices:

    - Do not open attachments or click links from unknown or suspicious senders.
    - Keep regular backups of important files and ensure security software is updated.

  (c) Paying an unknown attacker is not dependable because there is no guarantee that the files will be restored or that the attacker will not demand more money.

- Answer 43
  (a) The two technology-and-society issues involved are:

    - Accessibility – difficulty in using the portal due to different physical abilities.
    - Gender bias/stereotyping – repeated use of gender-based stereotypes in examples and classroom roles.

  (b) Inclusive design can make the portal usable by learners with different abilities through accessible controls, readable text, keyboard navigation, captions, etc. Inclusive classroom practices can avoid gender stereotypes, provide equal opportunities and roles, and use diverse examples, encouraging more students to participate.

(c) One accessibility feature is keyboard navigation, which allows learners who have difficulty using a mouse or touch controls to operate the portal using a keyboard.

- Answer 44

(a) The school should consider proper and authorised e-waste disposal, environmental impact, safe handling of electronic components, and protection of any data stored on the devices.

(b) Improper disposal of electronic devices can cause soil and water pollution and may expose the environment to harmful materials present in e-waste.

(c) Removing the hard drive only removes one component that may contain stored data. The remaining computer still contains electronic components, metals, plastics and circuit boards that require proper e-waste disposal.

- Answer 45

(a) The licence terms and permissions governing use, modification and redistribution should be checked.

(b) Copyright.

(c) Trademark.

(d) The team should understand the legal responsibilities associated with online activities, electronic records and cyber-related offences while developing and operating the application.

(e) Protect user information from unauthorised access and avoid unnecessary disclosure/sharing.

Practical List

S. N.	Practical	Month
1	Write a Python program to input a number and determine whether it is positive, negative or zero and whether it is odd or even.	Aug
2	Write a Python program to input the principal, rate of interest and time and calculate the simple and compound interest and total amount.	Aug
3	Write a Python program to input three numbers display the three numbers in ascending order.	Aug
4	Write a Python program to input the marks obtained by a student in five subjects, calculate the total and percentage, and display the grade according to the following criteria: 90% and above – A1, 80%–89% – A2, 70%–79% – B1, 60%–69% – B2, 50%–59% – C1, 40%–49% – C2, below 40% – D.	Aug
5	Write a Python program to input the number of units of electricity consumed and calculate the electricity bill using the following slabs: first 100 units at ₹2 per unit, next 100 units at ₹3 per unit, and units above 200 at ₹5 per unit.	Aug
6	Write a Python program to input a positive integer and calculate its factorial.	Sep
7	Write a Python program to input the number of terms and generate the Fibonacci series up to the specified number of terms and display the sum of the generated terms.	Sep
8	Write a Python program to calculate the sum of the following series for n terms: $1 + 2 + 3 + ... + n$, $1^2 + 2^2 + 3^2 + ... + n^2$, and $1 + 1/2 + 1/3 + ... + 1/n$.	Sep
9	Write a Python program using nested loops to generate the following patterns: (a) right-angled star triangle (b) inverted star triangle	Sep

	(c) number triangle (d) inverted number triangle.	
10	Write a Python program to input a string and count the number of uppercase letters, lowercase letters, digits, special characters, vowels and consonants present in the string.	Sep
11	Write a Python program to input a string and display it in uppercase, lowercase, capitalized and title case. Also count the occurrences of a specified character and check whether the string starts and ends with specified characters.	Sep
12	Write a Python program to input a string containing words separated by spaces and perform the following operations: (a) Remove leading and trailing spaces (b) Count the number of words (c) Replace a specified word (d) Join the words using - as a separator	Sep
13	Write a Python program to input a string and determine whether it is a palindrome.	Oct
14	Write a Python program to input a list of integers and find the maximum, minimum, sum and average of the elements.	Oct
15	A teacher has recorded the marks of students in a list: [78, 92, 65, 88, 92, 71, 85, 65, 90, 76]. Write a Python program to arrange the marks in ascending order, find the highest and lowest marks, calculate the average marks, and count how many students scored more than the average.	Oct
16	A school maintains the following list of house names: ["Tagore", "Ashoka", "Shivaji", "Tagore", "Raman"]. Write a Python program to perform the following operations in sequence: (a) Append "Gandhi" (b) Insert "Bose" at index 2 (c) Remove the first occurrence of "Tagore"	Oct

	(d) Reverse the list (e) Sort the list alphabetically Display the list after each operation.	
17	Write a Python program to input a list of integers and find the second largest and second smallest elements in the list.	Oct
18	Write a Python program using nested lists to create two 3 × 3 matrices and display their sum.	Nov
19	Write a Python program to input a tuple containing 10 integers and find its maximum, minimum, sum and average.	Nov
20	Write a Python program to input a tuple of integers and perform a linear search for a specified element. Display whether the element is present, its position(s), and the number of times it occurs.	Nov
21	Write a Python program to store the following information of three students in a tuple of tuples: (101, "Aarav", 11, "A", 85.5), (102, "Diya", 11, "A", 91.0), and (103, "Kabir", 11, "B", 78.5). Unpack each tuple and display the Roll No., Name, Class, Section and Percentage in a formatted manner.	Nov
22	A student record is stored as student = (101, "Aarav", 11, "A", 86.5) and subjects = ("English", "Mathematics", "Computer Science"). Write a Python program to unpack student and display the Name and Percentage, check whether "Mathematics" is present in subjects, and display the first two subjects using slicing.	Nov
23	A school maintains student records in a dictionary. {"RollNo": 15, "Name": "Riya", "Class": 11, "Section": "A", "Percentage": 86.5} Write a Python program to safely retrieve the student's house using get() and update the student's section using update(). Display the modified dictionary.	Dec

24	Write a Python program to input a string and create a dictionary containing each character as a key and its frequency as the corresponding value, ignoring spaces. Display the resulting dictionary.	Dec
25	Write a Python program using the math, random and statistics modules to: (a) Find the square root, ceiling, floor and power of given numbers (b) Generate random numbers using randint() and randrange() (c) Calculate the mean, median and mode of a list of numbers	Dec

“Technology turns ideas into opportunities.”

Learn | Practice | Grow

EXPLORE
EXPERIMENT
EXCEL

THINK
Creatively

CODE
Confidently

SOLVE
Smartly

BUILD
A Better Tomorrow



“Small Steps in Learning Lead to Big Changes in the Future.”

Better Learners | Brighter Tomorrow

Knowledge Creates Opportunities

SESSION 2026–27