



Prahladrai Dalmia Lions College Commerce & Economics
(Government Aided & Affiliated to University of Mumbai & AICTE, New Delhi)
- **NAAC Re-accredited with 'A' Grade (III Cycle) ISO 21001:2018 Certified**
University of Mumbai Recognised Research Centre in Accountancy, Commerce & Business Economics
A Government Approved Hindi Linguistic Minority Institute

ATKT SEMESTE III

Internal Examination Oct., 2026.

BSc.(Information Technology), NEP BATCH DATE - 17/10/2026

INSTRUCTIONS FOR THE STUDENTS HAVING ATKT IN INTERNALS:

1. Date of Submission of the Projects- 24th October, 2026 (Timings 11:00 am sharp)
2. **Reporting time for students: at least 10 minutes before the mentioned time.**
Venue: 2nd floor staff room). Please meet Mr. Prathamesh.
3. Students have to be present in person for the submission.
4. Submission of projects to be done on proper A4 size paper, handwritten by the candidate himself only. The Front page should contain details of Roll no, Name of the student, Semester, Subject.
5. **Print out of the questions uploaded should be attached along with the project. Students should also enclose a photocopy of the ATKT fee paid receipt along with each of his projects.**
6. On the date of submission there will be a viva voce on the given questions/topics.
7. If the student fails to present himself on the given date and time he will be marked ABSENT for the said subject.
8. **Any Submissions after the above mentioned date and time will not be accepted and entertained under any circumstances.**
9. **Note: If students have any discrepancies in the below mentioned questions or any queries related to same need to meet Dr. Rupali Mishra on or before 20 October, 2026 (by 11 am).**

Dr. Rupali Mishra

CA. Durgesh Kenkre

Ms. Subhashini Naikar

Prof. (Dr.) D. N. Ganjewar

(Coordinator - BSc.IT)

Exam Convener

Vice- Principal, SFC

(Principal)

DI/N-STD/GEN/00

SYBSc.I.T. SEMESTER III ATKT INTERNAL PROJECT QUESTIONS

NOTE: Students shall attempt any five questions out of the same as per their subjects allocated and in which they have ATKT only in internals

1. Environmental Management & Sustainable Development I

1. Explain the structure of an ecosystem (biotic and abiotic components) and describe ecological succession.
2. Describe any two ecosystems (forest, grassland, desert, aquatic) with their features and functions.
3. Explain genetic, species and ecosystem diversity, and name the biogeographic zones of India.
4. Name some endangered and endemic species of India. Explain man-wildlife conflict and biological invasions.
5. Explain the ecological, economic, social, ethical, aesthetic and informational values of ecosystem and biodiversity services.
6. Define a natural resource. Classify natural resources and explain microbes as a resource.
7. Explain the environmental problems caused by mineral extraction and soil degradation.
8. Explain the impacts of human population growth, and discuss resettlement and rehabilitation of project-affected persons.
9. Explain the role of Indian religions and cultures in environmental conservation, with the CNG vehicles in Delhi case as an example of environmental communication.
10. Explain environmental issues at local, regional and global scales. Describe land use and land cover change (deforestation, desertification, urbanization).

2. Indian Theatre: Classical Roots and Contemporary Expressions

1. Trace the development of Indian drama from Vedic rituals to Sanskrit drama.
2. Describe medieval folk and Bhakti theatre traditions and the colonial influences on Indian theatre.
3. Explain the significance of Bharata's *Natyashastra* as a treatise on Indian dramaturgy.
4. Describe the *Natyagriha* (ancient theatre architecture).
5. Explain *Rasa* theory and the aesthetic experience in Indian theatre.
6. Explain *Bhava* and *Abhinaya* and their relevance in classical performance.
7. Analyse the plot structure and character portrayal in Kalidasa's *Abhijnanasakuntalam* or *Malavikagnimitram*.
8. Discuss the key themes and innovations of Bhasa, Sudraka and Bhavabhuti.
9. Compare commercial and experimental theatre in terms of audience, staging and narrative.
10. Explain the structure of the one-act play and the origin, purpose and socio-political role of street theatre (*Nukkad Natak*).

3. Field Project (B.Sc. IT, Sem III)

1. Explain the objectives and importance of a field project in IT education.
2. Select any one topic from the list (e.g., Cyber Hygiene Among College Students) and write its problem statement and objectives.
3. How do you design an effective questionnaire for a field survey? Give a sample with five questions.
4. Differentiate between a questionnaire and an interview protocol. When is each preferred?
5. Explain sampling and data collection methods for a field survey.
6. Explain how collected data is analysed and presented (tables, charts, tools used).
7. What is a literature review? Explain its role in a field project.
8. Describe the structure and contents of a field project report.
9. How do you draw insights, conclusions and recommendations from survey data? Illustrate with an example.
10. Explain the ethical considerations in field work and the evaluation scheme of the field project.

4. हिंदी भाषा : व्यावहारिक प्रयोग

1. हिंदी भाषा का सामान्य परिचय देते हुए उसकी विशेषताएँ लिखिए।
2. राजभाषा हिंदी का संवैधानिक महत्त्व स्पष्ट कीजिए।

- हिंदी वर्णमाला में स्वर और व्यंजन के भेद उदाहरण सहित समझाइए।
- शब्द-भेद से क्या तात्पर्य है? संज्ञा के भेद उदाहरण सहित लिखिए।
- वाक्य की परिभाषा देकर उसके भेद स्पष्ट कीजिए।
- वर्तनी की सामान्य अशुद्धियाँ बताइए और शुद्ध वर्तनी के प्रयोग में सावधानियाँ लिखिए।
- कारक की परिभाषा देकर उसके भेद उदाहरण सहित समझाइए।
- विराम चिह्न किसे कहते हैं? प्रमुख विराम चिह्नों का प्रयोग उदाहरण सहित बताइए।
- मित्र को जन्मदिन की बधाई देते हुए पत्र लिखिए, अथवा किसी समारोह के लिए निमंत्रण पत्र लिखिए।
- सूचना के अधिकार (RTI) के अंतर्गत किसी सरकारी कार्यालय को आवेदन पत्र लिखिए, अथवा किसी सेवा के संबंध में शिकायत पत्र लिखिए।

5. Applied Mathematics

- Represent $z_1 = 3 + 4i$ and $z_2 = 1 - 2i$ on the Argand diagram. Find $z_1 \cdot z_2$ and z_1/z_2 .
- Express $1 + i\sqrt{3}$ in polar and exponential form.
- Define hyperbolic functions and state the relations between circular and hyperbolic functions. Separate $\sin(x + iy)$ into real and imaginary parts.
- Prove that $\sinh^{-1}x = \log(x + \sqrt{x^2 + 1})$.
- Define the Laplace transform. Find $L\{t^2\}$, $L\{e^{at}\}$ and $L\{\sin at\}$.
- State the first shifting theorem and find $L\{e^{-2t} \cos 3t\}$. State the second shifting theorem.
- State the convolution theorem. Find $L^{-1}\{1 / (s(s + 1)(s + 2))\}$ using partial fractions.
- Solve $y'' + 3y' + 2y = 0$, with $y(0) = 1$ and $y'(0) = 0$, using the Laplace transform.
- Solve: (a) $dy/dx = (x + y)/(x - y)$, (b) $(x^2 + y^2)dx - 2xy dy = 0$ using an integrating factor if needed, (c) $dy/dx + y/x = x^2$.
- Solve: (a) $p^2 - 5p + 6 = 0$ (solvable for p), (b) $y = px + p^2$ (Clairaut's form), (c) $(D^2 - 5D + 6)y = e^{4x}$.

6. Scala for Data Science (Practical)

- Set up Scala and SBT. Write a program that prints a welcome message and calculates mean, median and mode of a list of numbers.
- Write a program to generate 10 random numbers and find variance and standard deviation. Create Breeze dense vectors and compute sum, mean and dot product.
- Using Breeze, generate a random matrix and find its transpose and determinant. Slice a sub-matrix, calculate its row and column sums, and perform element-wise operations on two matrices.
- Read a CSV file, calculate basic statistics per numeric column, replace missing values with the column mean, and filter rows above a threshold.
- Write a program to count word frequencies in a text file and implement one-hot encoding for a categorical column.
- Using Breeze-viz, create a scatter plot, a histogram and a line graph, and combine two plots in one visualisation.
- Write programs for the Pearson correlation coefficient, moving average of a time series, and frequency and cumulative frequency distribution. Sort a dataset and extract the top 5 rows.
- Implement linear regression and logistic regression using Breeze on small datasets.
- Compute Euclidean distance for nearest neighbour classification, cluster data using k-means, and generate polynomial features up to degree 3.
- Set up Apache Spark and write programs for word count, DataFrame filter, group-by average, join of two CSV files, and a simple MLlib classification pipeline.

7. Python for Data Science (Practical)

- Write Python programs to print your profile, add two numbers, find a square root, calculate the area of a triangle and swap two variables.
- Create nested tuples, sort them using `sorted()`, and demonstrate the immutability of tuples.
- Write a program to copy or clone a list, and a program to store text in a variable and search it.
- Write a program to retrieve data from an HTML file using regular expressions.
- Write programs to print the current date in different formats, convert a timestamp to a date, and compare two dates.

6. Write a program using the calendar module to display a calendar.
7. Create a NumPy array, perform basic operations on it, and slice elements 1 to 5 from a 10-element array.
8. Write programs to sort an array alphabetically and to create a filter array that returns the maximum values.
9. Import Pandas, create a DataFrame object and display statistical information on a data set.
10. Create a Pandas Series from a dictionary and filter it using Boolean arrays.

8. Python + Data Structures (Major Practical 3)

1. Write programs to (a) accept name and age and print the year the user turns 100, (b) check even or odd, (c) print the grade for a given SGPI, (d) generate the Fibonacci series, (e) find the sum of digits of a number.
2. Write NumPy programs for basic operations, indexing and slicing, mathematical functions, aliasing vs copying, and analysing array dimensions and attributes.
3. Write functions to check Armstrong and palindrome numbers, a recursive factorial function, and a lambda to check whether a string starts with a given character. Create the `geometry.py` module and the `pointyShapeVolume()` function.
4. Write programs to count characters and words in a string, check whether two lists share a common member, sort a dictionary by value, and return area and circumference of a circle as a tuple.
5. Write programs for text and binary file operations, reading the last n lines of a file, counting a word using regular expressions, and extracting hyperlinks from an HTML file.
6. Write programs to compare two dates in DD/MM/YYYY format, measure execution time, and print the weekday of the first day of a given month using the calendar module.
7. Write a program to insert, delete and search (linear search) an element in an array, and a program for a singly linked list with insertion at the beginning, end and a given position, and deletion from a given position.
8. Implement a stack using an array and convert an infix expression to postfix. Implement a queue using an array and simulate a customer service queue.
9. Create a binary search tree with insert and search operations, implement pre-order, in-order and post-order traversals, and build a hash table with separate chaining.
10. Implement and compare bubble, insertion and selection sort, and linear and binary search. Design a simple program that uses multiple data structures.

9. Operating Systems

1. Explain the generations, types and structure of operating systems, and the services they provide.
2. Explain system calls, system boot, system programs, and protection and security in an OS.
3. Explain process concepts, process states and the Process Control Block. Describe threads and threading issues.
4. Explain scheduling criteria and compare FCFS, SJF and Round Robin with a numerical example.
5. Explain the critical-section problem, Peterson's solution and synchronization hardware.
6. Explain semaphores and the classic synchronization problems (producer-consumer, dining philosophers).
7. Explain deadlock characterization and the methods of prevention, avoidance, detection and recovery.
8. Explain swapping, contiguous memory allocation, paging with page table structure, and segmentation.
9. Explain virtual memory and demand paging. Compare FIFO, LRU and Optimal page replacement with an example, and explain thrashing.
10. Explain file concept, access methods, directory structure and file system structure.

10. Data Structures

1. Define data, information, data structure and ADT. Classify data structures and explain time complexity and Big O notation.
2. Explain array operations (traversal, insertion, deletion, searching) and compare arrays with linked lists.
3. Explain the Stack ADT (push, pop, peek) and its array implementation.
4. Convert an infix expression to postfix using a stack, with a worked example.
5. Explain the Queue ADT (enqueue, dequeue, peek), its array implementation and its use in scheduling.
6. Explain recursion with base case and recursive step, using factorial and Fibonacci as examples.
7. Explain binary tree representation and inorder, preorder and postorder traversals with an example.
8. Explain insertion, deletion and search in a binary search tree with an example.
9. Explain hash functions, hash tables and collision handling by separate chaining, with applications.

10. Explain any two sorting algorithms (bubble, insertion, selection) and binary search, with an example.

11. Python Programming

1. Explain the features of Python, execution of a Python program, the interpreter and IDLE.
2. Explain Python data types (including dictionaries and sets), variables, input/output functions and command-line arguments.
3. Explain the operators in Python with precedence and associativity.
4. Explain control statements: if, if-else, if-elif-else, loops, the else suite, break, continue, pass and assert.
5. Explain creating arrays, indexing and slicing (basic and advanced in NumPy), aliasing, and array dimensions and attributes.
6. Explain function definition and calling, returning multiple values, types of arguments, pass by object reference, recursive and lambda functions, and the difference between a function and a method.
7. Explain string operations, formatting, finding the number of characters and words, and modules in Python.
8. Explain lists (methods, operations, slices, nested lists), tuples and dictionaries with examples.
9. Explain text and binary file handling, the `with` statement, `pickle`, `seek()` and `tell()`, and zipping files.
10. Explain regular expressions (sequence and special characters, retrieving data from HTML) and date and time handling (formatting, comparing dates, the calendar module).