PRAHLADRAI DALMIA LIONS COLLEGE OF COMMERCE & ECONOMICS
ISO 9001: 2015 Certified

NOTICE

25th September, 2025

ATKT Internal and Practical Examination
B.Sc.I.T. (SEMESTER-VI)

INSTRUCTIONS FOR THE STUDENTS HAVING ATKT IN INTERNALS

1. Date of Submission of the Assignments-03 October, 2025
2. Timings 11:00 AM to 12:00 Noon. Reporting time for students: at least 10 minutes before the mentioned time. Venue: Computer Lab.
3. Students have to be present in person for the submission.
4. Submission of assignments 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 and **respective practical outputs (applicable for practical subjects)** should be attached along with the assignment.
6. Students should enclose a photocopy of the ATKT fee paid receipt along with each of his projects.
7. On the date of submission there will be a viva voce on the given questions/topics.
8. If the student fails to present himself on the given date and time he will be marked ABSENT for the said subject.
9. Any Submissions after the above mentioned date and time will not be accepted and entertained under any circumstances.

NOTE - Student who has paid ATKT fees for internal components but has not been allotted questions or has any query is requested to contact Dr. Rupali Mishra on or before, 28th September 2025 by mailing on bscit@dalmialionscollege.ac.in

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

SOFTWARE TESTING & QUALITY ASSURANCE

INT: Patel Mohd Safwan Fazal Ahmed (365)

1. **Explain the concept of Software Quality in detail.**
   Discuss historical perspectives, definitions of quality, Total Quality Management (TQM), and the role of customers and processes in achieving software quality. Illustrate the importance of benchmarking, metrics, and problem-solving techniques in improving quality.

2. **Describe the fundamental test process in software testing.**
   Explain the necessity of testing, principles of good testing, test policy, test strategy, test planning, and the psychology of testing. Discuss common misconceptions about testing with suitable examples.

3. **Write detailed notes on Unit Testing techniques.**
   Explain Boundary Value Testing (Normal, Robust, Worst-case, Special Value), Equivalence Class Testing, Decision Table-Based Testing, and Path Testing. Support your answer with examples and guidelines for each technique.

4. **What is Verification and Validation (V&V) in software testing?**
   Differentiate between verification and validation with examples. Discuss the V-Model, verification methods, validation levels, acceptance testing, and the management of V&V activities in the software development life cycle.

5. **Discuss the levels and tools of software testing.**
   Explain different levels of testing: proposal testing, requirement testing, design testing, unit testing, integration testing, system testing, and acceptance testing. Also, describe static and dynamic testing tools, advantages and disadvantages of automated testing, and taxonomy of testing tools (functional, regression, performance, configuration management, bug tracking, etc.).

INFORMATION SECURITY

INT: Patel Mohd Safwan Fazal Ahmed (365)

1. **Explain the importance of Information Security in today's digital environment.**
   Discuss the evolution of information security, the importance of protecting organizational assets, and the challenges faced in safeguarding information. Support your answer with real-life scenarios.

2. **Describe the fundamentals of cryptography in detail.**
   Explain encryption and decryption, symmetric and asymmetric key cryptography, hash functions, and digital signatures. Highlight their role in ensuring confidentiality, integrity, and authenticity of information.

3. **What are Intrusion Detection and Prevention Systems (IDPS)?**
   Differentiate between IDS and IPS. Discuss their types, working principles, advantages, limitations, and importance in network security.

4. **Explain the security aspects of virtualization and cloud computing.**
   Discuss the risks associated with virtual machines, hypervisors, and cloud services. Explain techniques and best practices for securing data, applications, and infrastructure in cloud environments.

5. **Write detailed notes on security mechanisms in communication systems.**
   Explain authentication, authorization, firewalls, and VPNs. Discuss VoIP and PBX security issues, common attacks, and countermeasures to secure communication over networks.

BUSINESS INTELLIGENCE & DATA ANALYTICS

INT:

Patel Mohd Safwan Fazal Ahmed (365)

1. **Explain the concept of Business Intelligence (BI) and its importance in decision-making.**
   Discuss BI architecture, components, and applications in organizations. How does BI help in transforming raw data into meaningful insights for strategic advantage?

2. **Describe the role of Data Warehousing in Business Intelligence.**
   Explain data warehouse architecture, ETL (Extract, Transform, Load) processes, and data integration. How do OLAP operations (Roll-up, Drill-down, Slice, Dice, Pivot) support business analysis?

3. **What is Data Mining? Explain its techniques with examples.**
   Discuss classification, clustering, association rule mining, regression, and anomaly detection. Explain how these techniques contribute to predictive and descriptive analytics.

4. **Discuss the concept of Big Data Analytics.**
   Define Big Data and explain its characteristics (Volume, Velocity, Variety, Veracity, Value). Describe the challenges in handling Big Data and how tools like Hadoop and Spark address these challenges.

5. **Explain the importance of Data Visualization in BI and Analytics.**
   Discuss visualization principles, dashboards, scorecards, and reporting tools. How do effective visualizations improve business understanding and decision-making? Give examples of popular BI visualization tools.

- Rasam Bhushan Ramchandra (327)

1. **Differentiate between Business Intelligence and Business Analytics.**
   Discuss their objectives, scope, and applications. Provide examples where BI is more suitable than BA and vice versa.

2. **Explain the architecture of a Data Warehouse in detail.**
   Discuss the components: data sources, ETL process, staging area, warehouse database, metadata, and data marts.

3. **What are OLAP systems? Explain MOLAP, ROLAP, and HOLAP with examples.**
   Compare their advantages and disadvantages in business decision-making.

4. **Discuss Association Rule Mining in detail.**
   Explain Apriori and FP-Growth algorithms with examples. Describe their importance in market basket analysis.

5. **Explain the role of predictive analytics in business.**
   Discuss regression, time-series forecasting, and machine learning methods for prediction. Provide practical use cases.

- Sharma Sneha Santosh (367)

1. **What are the challenges in implementing Business Intelligence solutions?**
   Discuss issues related to data quality, integration, scalability, cost, and organizational culture. Suggest ways to overcome them.

2. **Describe the types of data used in Business Intelligence.**
   Explain structured, semi-structured, and unstructured data. How are these managed in BI systems?

3. **Discuss real-time analytics in business applications.**
   Explain how stream processing and real-time dashboards help industries like banking, healthcare, and e-commerce.

4. **Write detailed notes on BI tools and technologies.**
   Compare popular BI tools such as Power BI, Tableau, QlikView, and Google Data Studio based on their features, advantages, and limitations.

5. **Explain the role of Key Performance Indicators (KPIs) and Balanced Scorecards in BI.**
   Discuss how organizations define, measure, and track KPIs to improve decision-making.

- Suthar Deepak Bhagirath (353)

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PRAC:

- Patel Mohd Safwan Fazal Ahmed (365)

1. **Create a Data Warehouse schema** for a retail company with dimensions like Product, Customer, and Time. Populate it with sample data.

2. **Perform ETL operations** (Extract, Transform, Load) on a given dataset using any BI tool (e.g., Talend, Pentaho, or SQL-based).

3. **Design and implement an OLAP cube** for sales analysis. Demonstrate operations like Roll-up, Drill-down, Slice, and Dice.

4. **Generate summary reports** (monthly/quarterly sales) using SQL GROUP BY and aggregation functions.

5. **Perform classification** on a dataset (e.g., predicting loan approval) using Decision Tree or Naïve Bayes algorithm.

- Sahani Rakesh Ramlavat (371)

1. **Perform clustering** on customer data using K-Means and interpret the business insights.

2. **Apply association rule mining** on a supermarket dataset and identify frequent item sets using Apriori algorithm.

3. **Perform regression analysis** (linear or logistic) on a dataset and interpret the results for business forecasting.

4. **Use Big Data tools** (Hadoop/Spark) to analyze large datasets and generate insights.

5. **Create an interactive dashboard** in Tableau/Power BI showing KPIs such as sales, profit, and customer retention.

- Suthar Deepak Bhagirath (353)

1. **Design data visualizations** (bar chart, pie chart, scatter plot, heatmap) for a dataset and explain which visualization is most effective for decision-making.

2. **Perform time-series analysis** (e.g., stock price, sales data) to predict future trends.

3. **Implement a sentiment analysis** on social media data (tweets/reviews) using BI tools or Python libraries.

4. **Compare BI tools** (Power BI, Tableau, QlikView, Google Data Studio) by performing the same dataset analysis and preparing a comparative report.

5. **Mini-project:** Integrate multiple datasets (e.g., customer, sales, product) and build a **complete BI solution** including ETL, OLAP analysis, data mining, and visualization.

SOFTWARE QUALITY ASSURANCE

INT:

- Dayama Pramodkumar Navalkishor (306)

1. **Define Software Quality.** Explain the historical perspectives, core components of quality, Total Quality Management (TQM), and the role of benchmarking and metrics in improving software quality.

2. **Discuss the relationship between software quality and productivity.** How do organizational culture and development processes influence software quality?

3. **Explain the fundamental test process in detail.** Describe the psychology of testing, principles of software testing, misconceptions, and the role of Requirement Traceability Matrix (RTM).

4. **What is a good testing strategy?** Discuss test policies, test planning, challenges in testing, and methods to improve test team efficiency.
5. **Explain Boundary Value Testing and Equivalence Class Testing with suitable examples.** Discuss their guidelines, advantages, and limitations.

- Paliwal Mamta Tarashankar (334)

1. **Describe Decision Table-Based Testing and Path Testing.** How do they help in detecting defects during unit testing? Illustrate with examples.

2. **Differentiate between Verification and Validation.** Explain their workbenches, methods, coverage, and the role of the V-Model in software testing.

3. **Discuss different levels of testing.** Explain unit testing, integration testing, system testing, acceptance testing, and maintenance testing with examples.

4. **What are software testing tools?** Discuss the taxonomy of testing tools (functional, regression, performance, bug tracking, configuration management). What are the

advantages and limitations of automated tools?

5. **Explain common challenges in software testing.** Discuss process problems, people issues, cost aspects, and how management awareness and skills of testers play a role in successful quality assurance.

SECURITY IN COMPUTING

INT:

- Dayama Pramodkumar Navalkishor (306)

1. **Define Information Security.** Discuss its objectives (CIA triad – Confidentiality, Integrity, Availability) and explain the evolution of security practices.

2. **Explain different types of security threats and attacks.** Classify them into active, passive, insider, and outsider threats with examples.

3. **What is Cryptography?** Explain symmetric and asymmetric encryption techniques with algorithms (DES, AES, RSA) and their applications.

4. **Discuss hashing and digital signatures in detail.** How do they ensure data integrity and authentication?

5. **Explain authentication mechanisms.** Compare passwords, biometrics, smart cards, and multi-factor authentication with advantages and limitations.

- Paliwal Mamta Tarashankar (334)

1. **What are Security Policies and Procedures?** Explain their importance in organizations with examples of common policies (password policy, access control, backup policy).

2. **Explain Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS).** Discuss their types, working, and role in network security.

3. **Discuss Firewalls and VPNs.** Explain their types, architecture, and role in securing communication over public networks.

4. **What is VoIP security?** Discuss PBX vulnerabilities, possible attacks, and techniques to secure VoIP-based communication systems.

5. **Explain the role of Public Key Infrastructure (PKI).** Discuss digital certificates, Certificate Authorities (CA), and SSL/TLS protocols.

- Lad Madhavi Mangesh (No Roll No)

1. **Discuss security issues in Virtualization.** What are the risks associated with hypervisors and virtual machines? Suggest best practices for securing virtual environments.

2. **What are the major security challenges in Cloud Computing?** Explain data privacy, multi-tenancy, insider threats, and regulatory compliance issues.

3. **Explain techniques for securing cloud environments.** Discuss encryption, access control, identity management, and cloud monitoring tools.

4. **Discuss the concept of Cyber Forensics.** Explain the process of collecting, preserving, analyzing, and presenting digital evidence.

5. **Write detailed notes on recent trends in Information Security.** Explain Zero Trust security model, AI/ML in cybersecurity, Blockchain-based security, and emerging challenges like ransomware and IoT security.

PRAC:

- Dayama Pramodkumar Navalkishor (306)

1. **Implement symmetric key encryption and decryption** using any programming language (e.g., AES/DES).

2. **Demonstrate RSA (asymmetric encryption)** for secure key exchange and verify with sample plaintext/ciphertext.

3. **Implement hashing techniques** (e.g., MD5, SHA-1, SHA-256) and show how hash values change with input.

4. **Simulate Digital Signatures** using public and private keys to verify authenticity and integrity of a message.

5. **Configure a firewall** (software-based like iptables/Windows firewall) to allow/deny specific ports and services.

- Paliwal Mamta Tarashankar (334)

1. **Set up a Virtual Private Network (VPN)** connection and analyze packet flow using Wireshark.

2. **Demonstrate Intrusion Detection/Prevention System (IDS/IPS)** using a tool such as Snort, Suricata, or Security Onion.

3. **Perform a password-cracking experiment** using tools like John the Ripper or Hydra, and discuss preventive measures.

4. **Configure user authentication** with multi-factor authentication (MFA) in a sample web or system environment.

5. **Simulate a cloud security scenario** (e.g., using AWS Free Tier, Google Cloud, or a private cloud tool) to implement access control and encryption of stored data.

BUSINESS INTELLIGENCE

INT:

- Dayama Pramodkumar Navalkishor (306)

1. Define Business Intelligence (BI). Explain its importance in modern organizations.

2. What is OLAP? Explain OLAP operations (Roll-up, Drill-down, Slice, Dice, Pivot) with examples.

3. Discuss the role of BI in decision-making and strategic planning.

4. Describe classification techniques in data mining with examples.

5. Explain dashboards and scorecards with examples.

- Swamy Jency Anthony (363)

1. What are the challenges in implementing a BI solution? Suggest possible solutions.

2. Compare different BI visualization tools such as Tableau, Power BI, and QlikView.
3. Define Big Data and explain its characteristics (Volume, Velocity, Variety, Veracity, Value).
4. Explain clustering techniques (K-Means, Hierarchical clustering) with real-life applications.
5. What is Association Rule Mining? Explain Apriori algorithm with an example.

- Paliwal Mamta Tarashankar (334)

1. Differentiate between OLTP and OLAP with suitable use cases.
2. Explain ETL (Extract, Transform, Load) processes in detail with an example.
3. Discuss the role of BI in predictive modeling and forecasting.
4. Create a case study of how BI visualization helped an organization in decision-making.
5. Define a Data Warehouse. Explain its characteristics and architecture.

- Chauhan Rahul Tribhuvan (303)

1. Explain real-time analytics with examples of industries using it (banking, healthcare, e-commerce).
2. Compare Hadoop and Spark frameworks for data processing.
3. What is real-time business intelligence? Explain its applications.
4. Describe the architecture and components of a Business Intelligence system.
5. Discuss the differences between MOLAP, ROLAP, and HOLAP.

- Rai Simran Vinod (368)

1. Explain the integration of BI with cloud computing. What are its advantages and challenges?
2. Write short notes on emerging BI trends – AI in BI, Self-service BI, and Mobile BI.

3. Define Data Visualization. Explain why visualization is important in BI.

4. Differentiate between Business Intelligence (BI) and Business Analytics (BA) with suitable examples.

5. Explain the role of Key Performance Indicators (KPIs) in BI. How are KPIs tracked in dashboards?

- Yadav Shikha Harihar (358)

1. Explain the role of Hadoop in Big Data Analytics.

2. Discuss the difference between descriptive and predictive analytics in BI.

3. Explain the principles of good visualization design.

4. Discuss the challenges in handling Big Data and how they are addressed.

5. What is Data Mining? Explain its importance in BI.

PRAC:

- Dayama Pramodkumar Navalkishor (306)

1. Import the given dataset into Excel and generate a pivot table and chart for sales performance.

2. Import a data cube into Excel and generate pivot tables and charts for regional analysis.

3. Apply Goal Seek, Scenario Manager, or Data Tables on the dataset and prepare a summary report.

4. Perform classification on a customer dataset and evaluate the model accuracy.

5. Classify a student performance dataset and generate a confusion matrix.

- Swamy Jency Anthony (363)

1. Group customers based on purchase history using clustering and visualize the results.

2. Perform clustering on market segmentation data and plot a dendrogram.
3. Predict sales revenue based on advertisement spend using regression analysis.
4. Predict whether a customer will purchase (Yes/No) based on demographic attributes.
5. Read a CSV file, perform summary statistics, and generate insights like mean, median, and correlations.

- Paliwal Mamta Tarashankar (334)

1. Create bar charts, histograms, and scatter plots for the given dataset.
2. Import sales data and create dashboards with KPIs, pie chart, and line chart.
3. Create staging tables in SQL, load raw data, and transform it into structured format.
4. Design and build a cube with appropriate dimension and fact tables.
5. Combine Excel, Python, and Power BI to analyze sales data end-to-end and prepare a report.

PRINCIPLES OF GIS / FUNDAMENTALS OF GIS

INT:

- Dayama Pramodkumar Navalkishor (306)

1. Define GIS. Explain its components.
2. Differentiate between GIS, GPS, and Remote Sensing.
3. Explain the evolution and history of GIS.
4. What are the main applications of GIS in different fields?
5. Describe the basic elements of a GIS.

- Gupta Shubham Satendra (No Roll No)

1. Explain the concept of layers in GIS.
2. What is spatial data? Explain with examples.
3. What is non-spatial data? Give suitable examples.
4. Differentiate between raster data model and vector data model.
5. Write advantages and disadvantages of raster data model.

- Khedekar Sahil Pramod (317)

1. Write advantages and disadvantages of vector data model.
2. Explain the concept of topology in GIS.
3. What is georeferencing? Why is it important in GIS?
4. Explain map projection and its types.
5. What is scale in GIS? How is it represented?

- Paliwal Mamta Tarashankar (334)

1. Differentiate between small scale and large scale maps.
2. Explain the concept of spatial resolution.
3. What is attribute data in GIS? Explain its storage structures.
4. Explain database models used in GIS (hierarchical, network, relational, object-oriented).
5. Define spatial analysis. What are its types?

- Patel Mohd Safwan Fazal Ahmed (365)

1. Explain buffering and overlay analysis in GIS.
2. What is network analysis in GIS? Explain its applications.
3. Explain digital elevation model (DEM).
4. What are the main sources of spatial data?
5. Explain GPS and its role in GIS data collection.

- Chauhan Rahul Tribhuvan (303)

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PRAC:

- Dayama Pramodkumar Navalkishor (306)

1. Install and configure open-source GIS software (QGIS/GRASS GIS) and explore its interface.
2. Load a raster dataset (satellite image) into GIS software and visualize different bands.
3. Load a vector dataset (shapefile) into GIS software and explore its attribute table.
4. Perform coordinate system transformation on a given dataset.
5. Georeference a scanned topographic map using ground control points

- Paliwal Mamta Tarashankar (334)

1. Digitize point, line, and polygon features from a given map.

2. Create and edit attribute data for a vector layer.
3. Perform buffer analysis around point features (e.g., schools, hospitals).
4. Perform overlay analysis using two polygon layers (e.g., land use and soil type).
5. Generate a thematic map using attribute data (e.g., population density map).

- Patel Mohd Safwan Fazal Ahmed (365)

1. Perform spatial query and attribute query on a dataset (e.g., find cities with population > X).
2. Create a Digital Elevation Model (DEM) and generate a contour map.
3. Perform network analysis to find the shortest path between two locations.
4. Create a map layout with title, scale bar, north arrow, and legend.
5. Export a GIS project as a PDF/PNG map for presentation or reporting.

CYBER LAW

INT:

- Dayama Pramodkumar Navalkishor (306)

1. Define Cyber Law. Why is it important in today's digital era?
2. Explain the objectives and scope of the Information Technology (IT) Act, 2000.
3. What are the main provisions of the IT Act, 2000 related to cybercrimes?
4. Differentiate between cybercrime and conventional crime with examples.
5. Explain different types of cybercrimes (hacking, phishing, identity theft, cyberstalking, etc.).

- Paliwal Mamta Tarashankar (334)

1. What is digital signature? Explain its legal validity under Indian law.
2. What is electronic governance (e-governance) under the IT Act? Give examples.
3. Explain the concept of cyber contraventions and penalties under IT Act, 2000.
4. What is the role of the Certifying Authority in digital signatures?
5. Discuss the legal issues related to electronic contracts.

- Naik Anurag Anil (316)

1. Explain the provisions regarding data protection and privacy under Indian cyber law.
2. What are the cyber laws related to Intellectual Property Rights (IPR) in cyberspace?
3. Explain jurisdiction issues in cybercrime cases with suitable examples.
4. What are the powers of adjudicating officers and the Cyber Appellate Tribunal under the IT Act?
5. Discuss recent amendments and emerging challenges in cyber law (AI, cloud, social media).

ADVANCED MOBILE PROGRAMMING

PRAC:

- Dayama Pramodkumar Navalkishor (306)

1. Develop an Android application to display a welcome message using a TextView.
2. Create an Android application to demonstrate Explicit and Implicit Intents.
3. Write an Android program to demonstrate Activity lifecycle with Toast messages.

4. Develop an application using RecyclerView to display a list of items with custom Adapter.

5. Create an Android application to demonstrate the use of Fragments.

- Paliwal Mamta Tarashankar (334)

1. Write an Android program to perform insert, update, and delete operations using SQLite database.

2. Develop an Android application to demonstrate SharedPreferences for storing user login details.

3. Create an Android application to send and receive data between two Activities using Intent.

4. Write an Android program to demonstrate Google Maps integration and show the current location.

5. Develop an Android application to demonstrate background service (e.g., play music in the background).

IT ACT & CYBER LAW

INT:

- Patel Mohd Safwan Fazal Ahmed (365)

1. Explain the objectives and scope of the Information Technology (IT) Act, 2000.

2. What are the legal recognitions provided to electronic records and digital signatures under the IT Act?

3. Discuss the role and responsibilities of Certifying Authorities in India.

4. Explain the provisions related to cybercrimes under the IT Act with examples.

5. What is the difference between civil contraventions and criminal offences under the IT Act?

- Rasam Bhushan Ramchandra (327)

1. Describe the powers and functions of the Cyber Appellate Tribunal.
2. Explain legal issues related to electronic contracts under the IT Act.
3. What are the provisions related to data protection and privacy in the IT Act?
4. Discuss the penalties and adjudication process for cyber contraventions.
5. Write a short note on amendments made to the IT Act to address emerging cyber threats.

ANDROID PROGRAMMING PRACTICAL

PRAC:

Patel Mohd Safwan Fazal Ahmed (365)

1. Develop an Android application to display a welcome message using a TextView.
2. Create an Android app with two buttons: one to change background color and another to reset it.
3. Write an Android program to demonstrate the use of EditText, Button, and Toast message.
4. Create an Android application to perform basic arithmetic operations (Add, Subtract, Multiply, Divide).
5. Develop an application to demonstrate the use of CheckBox and RadioButton

Shaikh Arshiya Mohd Ashraf (366)

1. Write an Android program to demonstrate the use of Spinner (Dropdown list).
2. Create an Android application to demonstrate Explicit Intent (open another activity).

3. Develop an Android app to demonstrate Implicit Intent (e.g., open dialer, browser, or email).
4. Write an Android program to demonstrate Activity lifecycle using Toast or Log messages.
5. Create an Android app to pass data between two Activities using Intent.

Suthar Deepak Bhagirath (353)

1. Develop an application to demonstrate the use of ListView with ArrayAdapter.
2. Write an Android program to demonstrate RecyclerView with custom Adapter.
3. Create an Android app to demonstrate use of Fragments in a single activity.
4. Write an Android program to demonstrate SharedPreferences for storing username and password.
5. Develop an app to insert, update, and delete student records using SQLite database.

Tiwari Tanmay Tarakant (337)

1. Create an Android application to demonstrate use of DatePicker and TimePicker.
2. Write an app to demonstrate sending SMS from an Android application.
3. Create an Android application to demonstrate Google Maps integration and current location tracking.
4. Develop an app to demonstrate background service (e.g., play music in background).
5. Create an Android application to design a simple login form and validate input fields.