INTERMEDIATE EXAMINATION PREPARATION

CLASS 11 — COMPUTER SCIENCE AND ENTREPRENEURSHIP

CHAPTER 1

INTRODUCTION TO SOFTWARE DEVELOPMENT

80 Topic-wise MCQs • Verified 2027 syllabus • English / Urdu explanations

Past-paper verification ledger • Unmarked MCQ practice test

Source: Uploaded PECTAA/Punjab Grade 11 textbook, Unit 1, textbook pages 1–19 (PDF pages 4–22).

The main question bank marks correct answers. Practice-test answers are separate.

2027 PECTAA SMART-SYLLABUS NOTICE | VERIFIED OFFICIAL SOURCE

As of 9 November 2026: PECTAA notification No. PECTAA/C&C Unit/2026/1239 (6 Nov 2026) applies to Punjab BISE Annual Examination 2027.

Chapter 1: Section 1.5 (Graphical Representation of Software Systems; printed pp. 9–13) is EXCLUDED for the 2027 exam. Retained below as supplementary learning only.

Deleted textbook exercise items: MCQ #7; short questions #5 and #6; long questions #1, #3 and #4. Do not treat these as 2027 examination priorities.

Official 2027 pairing scheme: 3 MCQs from Chapter 1; 4 short questions offered in Q2 from Chapter 1. No dedicated 8-mark long question from Chapter 1.

Source: https://pectaa.edu.pk/wp-content/uploads/2026/11/ALP-Notification-Grade-11.pdf (document PDF pp. 43, 45–47; zero-based index 42, 44–46).

Past-paper verification: No original board examination scripts with authenticated board/year identifiers were established for these questions. Historical repetition counts are therefore NOT VERIFIED; do not infer board appearances from textbook or model-paper matches.

Official 2027 MODEL PAPER is an assessment specimen, not an actually administered past examination. Its Chapter 1 sample MCQ concepts include Singleton, short cycles/sprints, and non-functional requirements.

SECTION 1 | Chapter overview and topic priorities

The priorities below are instructional estimates based on textbook coverage, the end-of-chapter exercise, and conceptual importance; they are not verified frequency statistics from past board examinations.

Textbook heading	Priority	Important concepts	Evidence
1.1 Software Development	⭐⭐	Coding, testing, debugging	Textbook concepts
1.2 Software Development Life Cycle (SDLC)	⭐⭐⭐	SDLC stages, requirements, framework	Textbook concepts; exercise
1.3 Software Development Methodologies	⭐⭐⭐	Waterfall, Agile, CI, TDD	Textbook concepts; exercise
1.4 Project Planning and Management	⭐⭐⭐	Timelines, costs, risks, QA	Textbook concepts; exercise
1.5 Graphical Representation and UML	2027 EXCLUDED	Use case, class, sequence, activity	PECTAA 2027 ALP, printed pp. 9–13

1.6 Introduction to Design Patterns	⭐⭐	Singleton, Factory, Observer, Strategy	Textbook concepts; exercise
1.7 Software Debugging and Testing	⭐⭐⭐	Testing hierarchy, debugging	Textbook concepts
1.8 Software Development Tools	⭐⭐	Editors, translators, IDEs, repos	Textbook concepts; exercise

Priority legend: ⭐⭐⭐ very important; ⭐⭐ important. Section 1.5 is EXCLUDED for 2027; always check the applicable current board syllabus for any deletions.

SECTION 2 | Topic-wise MCQs with highlighted answers

1.1 Software Development ⭐⭐

Core concept: Software development is the process of creating computer programs for specific tasks. It includes writing code, testing the solution, and resolving issues.

Q1. What is the main purpose of software development?

A) To create programs for specific tasks ✓

B) To manufacture monitors

C) To repair printers only

D) To connect cables

Correct answer: A | Explanation: Software development creates software to solve needs.

اردو وضاحت: سافٹ ویئر ڈویلپمنٹ میں پروگرام بنانا، اس کی جانچ کرنا اور غلطیاں دور کرنا شامل ہے۔

Q2. Which activity belongs to software development?

A) Painting a wall

B) Writing program code ✓

C) Printing a book

D) Replacing a keyboard

Correct answer: B | Explanation: Coding is a core software-development activity.

Q3. What should be checked before software is released?

A) Its packaging color

B) Its keyboard brand

C) Whether it works correctly ✓

D) The user’s handwriting

Correct answer: C | Explanation: Testing helps confirm expected behavior.

Q4. What is a bug in a software program?

A) A memory card

B) A website theme

C) A user manual

D) An error in the software ✓

Correct answer: D | Explanation: A bug is a mistake causing unexpected behavior.

Q5. Which action directly corrects a detected bug?

A) Debugging ✓

B) Buying hardware

C) Changing screen size

D) Deleting a user guide

Correct answer: A | Explanation: Debugging is the process of finding and fixing errors.

اردو وضاحت: سافٹ ویئر ڈویلپمنٹ میں پروگرام بنانا، اس کی جانچ کرنا اور غلطیاں دور کرنا شامل ہے۔

Q6. Which is an example of software?

A) A metal case

B) A library-management application ✓

C) A mouse pad

D) A network cable

Correct answer: B | Explanation: An application is software used to perform tasks.

Q7. Why is planning useful before coding?

A) It removes all need for testing

B) It makes errors impossible

C) It clarifies requirements and tasks ✓

D) It replaces the user

Correct answer: C | Explanation: Planning helps define what the software must do.

Q8. Which statement best describes software maintenance?

A) It is always done before coding

B) It means manufacturing disks

C) It is only naming variables

D) It includes updates after release ✓

Correct answer: D | Explanation: Maintenance continues after deployment.

Q9. A student builds a calculator application. This is an example of what?

A) Software development ✓

B) Hardware assembly

C) Network cabling

D) Document printing

Correct answer: A | Explanation: Building a calculator application is software creation.

Q10. Which sequence makes sense for creating a simple app?

A) Deploy before any testing

B) Understand the need, code, test ✓

C) Ignore needs, then release

D) Test without a program

Correct answer: B | Explanation: A software solution begins by understanding the task.

اردو وضاحت: سافٹ ویئر ڈویلپمنٹ میں پروگرام بنانا، اس کی جانچ کرنا اور غلطیاں دور کرنا شامل ہے۔

1.2 Software Development Life Cycle (SDLC) ⭐⭐⭐

Core concept: SDLC is a framework that organizes software creation from requirements to maintenance. Its stages include requirement gathering, design, coding, testing, deployment, and maintenance. A software framework supplies reusable components and structure; it is not the SDLC itself.

Q1. What is the primary purpose of SDLC?

A) To manufacture hardware

B) To organize high-quality software development ✓

C) To remove all maintenance

D) To manage only databases

Correct answer: B | Explanation: SDLC structures development from initial idea to maintenance.

اردو وضاحت: SDLC سافٹ ویئر بنانے کے مراحل کو منظم کرتا ہے۔ Functional ضرورت کام بتاتی ہے جبکہ Non-functional معیار بتاتی ہے۔

Q2. Which SDLC phase identifies user needs?

A) Testing

B) Deployment

C) Requirement gathering ✓

D) Maintenance

Correct answer: C | Explanation: Requirements are collected before design and coding.

Q3. Which is a functional requirement?

A) Response within two seconds

B) Availability of 99.9%

C) Encrypted storage

D) Users can borrow books ✓

Correct answer: D | Explanation: A functional requirement states an action the system performs.

Q4. Which is a non-functional requirement?

A) The system supports 1,000 users ✓

B) Users can register

C) Users can search books

D) Staff can add inventory

Correct answer: A | Explanation: Capacity is a quality/performance constraint.

Q5. Which phase converts specifications into program code?

A) Deployment

B) Coding ✓

C) Maintenance

D) Requirement gathering

Correct answer: B | Explanation: Implementation translates the design into code.

اردو وضاحت: SDLC سافٹ ویئر بنانے کے مراحل کو منظم کرتا ہے۔ Functional ضرورت کام بتاتی ہے جبکہ Non-functional معیار بتاتی ہے۔

Q6. Which SDLC stage decides software structure and diagrams?

A) Testing

B) Maintenance

C) Design ✓

D) Deployment

Correct answer: C | Explanation: Design specifies architecture, models, and components.

Q7. Which stage makes the software available to users?

A) Requirement gathering

B) Design

C) Testing

D) Deployment ✓

Correct answer: D | Explanation: Deployment installs or releases the working system.

Q8. Which activity is typical of requirement gathering?

A) Interviews and surveys ✓

B) Writing compiled code only

C) Publishing the app

D) Fixing post-release bugs

Correct answer: A | Explanation: Interviews and surveys identify stakeholder needs.

Q9. Which SDLC phase includes updates after release?

A) Design

B) Maintenance ✓

C) Requirement gathering

D) Initial coding only

Correct answer: B | Explanation: Maintenance fixes defects and adapts released software.

Q10. Which statement best defines a software framework?

A) A finished laptop

B) A substitute for user needs

C) A reusable structure and components for apps ✓

D) A physical network switch

Correct answer: C | Explanation: Frameworks provide predefined components and architecture.

اردو وضاحت: SDLC سافٹ ویئر بنانے کے مراحل کو منظم کرتا ہے۔ Functional ضرورت کام بتاتی ہے جبکہ Non-functional معیار بتاتی ہے۔

1.3 Software Development Methodologies ⭐⭐⭐

Core concept: Software methodologies guide how teams plan, build, and manage software projects. The Waterfall model follows largely sequential stages; Agile uses short iterations and feedback. Neither method is universally best.

Q1. Which methodology uses sequential development phases?

A) Agile

B) Scrum

C) Waterfall ✓

D) Pair programming

Correct answer: C | Explanation: Waterfall progresses through defined phases.

اردو وضاحت: Waterfall میں مراحل ترتیب سے مکمل ہوتے ہیں جبکہ Agile میں مختصر iterations اور مسلسل feedback لیا جاتا ہے۔

Q2. Which model is generally suitable when requirements are stable?

A) Rapid iteration

B) Unplanned development

C) Frequent requirement changes

D) Waterfall ✓

Correct answer: D | Explanation: Stable, well-defined requirements suit Waterfall.

Q3. What is a sprint in Agile development?

A) A short, planned work iteration ✓

B) The final maintenance phase

C) A type of computer virus

D) A hardware test

Correct answer: A | Explanation: Agile work is organized into short iterations.

Q4. Which is an Agile practice mentioned in the chapter?

A) Never testing software

B) Continuous integration ✓

C) Skipping user feedback

D) Fixing requirements permanently

Correct answer: B | Explanation: Continuous integration merges code changes regularly.

Q5. Which approach commonly responds better to changing requirements?

A) Waterfall only

B) Neither approach

C) Agile ✓

D) Hardware design

Correct answer: C | Explanation: Agile is designed for adapting through iterations.

اردو وضاحت: Waterfall میں مراحل ترتیب سے مکمل ہوتے ہیں جبکہ Agile میں مختصر iterations اور مسلسل feedback لیا جاتا ہے۔

Q6. What is a challenge of the Waterfall model?

A) It cannot have documentation

B) It has no phases

C) It never requires testing

D) Late changes can be costly ✓

Correct answer: D | Explanation: Waterfall is less flexible after phase completion.

Q7. In pair programming, how many developers work together at one workstation?

A) Two ✓

B) One hundred

C) Zero

D) Ten

Correct answer: A | Explanation: Pair programming uses two developers collaborating.

Q8. In test-driven development, developers typically write what first?

A) Deployment documentation

B) Tests before code ✓

C) Marketing material

D) User accounts

Correct answer: B | Explanation: TDD begins by defining expected behavior in tests.

Q9. What is a benefit of Agile increments?

A) No need for a team

B) Guaranteed fixed costs

C) Frequent feedback on working software ✓

D) No requirement changes

Correct answer: C | Explanation: Small deliverables enable frequent customer review.

Q10. Which issue can complicate Agile projects involving many teams?

A) No communication needed

B) No user input ever

C) No iterative planning

D) Coordinating a large project ✓

Correct answer: D | Explanation: Agile at scale requires careful coordination.

اردو وضاحت: Waterfall میں مراحل ترتیب سے مکمل ہوتے ہیں جبکہ Agile میں مختصر iterations اور مسلسل feedback لیا جاتا ہے۔

1.4 Project Planning and Management ⭐⭐⭐

Core concept: Project management sets scope, schedules, cost expectations, risks, execution responsibilities, and quality checks. This chapter discusses comprehensive planning, timelines, estimation, risk assessment, execution, and quality assurance.

Q1. What is the main purpose of project planning?

A) To avoid defining tasks

B) To understand scope, time and cost ✓

C) To remove teamwork

D) To skip risk management

Correct answer: B | Explanation: Planning defines project work, schedule, and resources.

اردو وضاحت: Project planning میں اہداف، وقت، اخراجات، خطرات اور معیار کی جانچ کا انتظام کیا جاتا ہے۔

Q2. Which factor generally affects development cost?

A) Wallpaper color

B) Computer brand logo

C) Development team size ✓

D) Office wall paint

Correct answer: C | Explanation: The number and skill of developers influence cost.

Q3. What does a project timeline specify?

A) The color of diagrams

B) User passwords

C) Coding language only

D) When tasks should be completed ✓

Correct answer: D | Explanation: A timeline schedules project activities.

Q4. Which step comes first in risk management?

A) Identify potential risks ✓

B) Ignore all risks

C) Release software immediately

D) Remove quality checks

Correct answer: A | Explanation: Risks must be identified before mitigation.

Q5. What does risk mitigation mean?

A) Estimating screen resolution

B) Reducing the impact of identified risks ✓

C) Writing user stories only

D) Deleting the schedule

Correct answer: B | Explanation: Mitigation is a response plan to limit risk.

اردو وضاحت: Project planning میں اہداف، وقت، اخراجات، خطرات اور معیار کی جانچ کا انتظام کیا جاتا ہے۔

Q6. Which is an example of a technical project risk?

A) A font preference

B) A staff birthday

C) Server failure ✓

D) A logo color

Correct answer: C | Explanation: Technology failures can disrupt delivery.

Q7. Which activity belongs to execution?

A) Deciding nothing

B) Writing no code

C) Skipping all meetings

D) Developing software and tracking progress ✓

Correct answer: D | Explanation: Execution is the active implementation phase.

Q8. What is the purpose of quality assurance?

A) To verify standards and correct operation ✓

B) To choose only logo colors

C) To avoid reviews

D) To replace requirements

Correct answer: A | Explanation: QA checks software quality throughout the project.

Q9. What is a milestone?

A) A physical keyboard

B) An important scheduled project checkpoint ✓

C) A type of database

D) A programming language

Correct answer: B | Explanation: Milestones mark progress toward major deliverables.

Q10. What should a team do when a major new risk appears?

A) Ignore it

B) Delete every milestone

C) Review the risk and adjust plans ✓

D) Stop all communication

Correct answer: C | Explanation: Continuous monitoring allows prompt response.

اردو وضاحت: Project planning میں اہداف، وقت، اخراجات، خطرات اور معیار کی جانچ کا انتظام کیا جاتا ہے۔

1.5 Graphical Representation and UML ⭐⭐⭐ [2027 EXCLUDED — SUPPLEMENTARY ONLY]

Core concept: UML (Unified Modeling Language) is a standard notation for visualizing software systems. This chapter introduces use case, class, sequence, and activity diagrams; each answers a different design question.

Q1. What does UML stand for?

A) Universal Machine Logic

B) User Modeling List

C) Unified Modeling Language ✓

D) Uniform Memory Layout

Correct answer: C | Explanation: UML is the standard visual modeling language discussed here.

اردو وضاحت: UML کے ذریعے سسٹم کو diagram کی شکل میں دکھایا جاتا ہے۔ ہر diagram مختلف پہلو واضح کرتا ہے۔

Q2. Which UML diagram shows interactions from a user perspective?

A) Class diagram

B) Sequence diagram

C) Activity diagram

D) Use case diagram ✓

Correct answer: D | Explanation: Use cases describe how actors interact with system functions.

Q3. In a use case diagram, an actor represents what?

A) A user or external system interacting with the system ✓

B) A database column

C) A programming error

D) A hidden algorithm

Correct answer: A | Explanation: Actors are people or other systems outside the modeled system.

Q4. Which diagram primarily represents classes and their relationships?

A) Activity diagram

B) Class diagram ✓

C) Use case diagram

D) Flowchart only

Correct answer: B | Explanation: Class diagrams describe structural organization.

Q5. Which diagram emphasizes messages over time?

A) Class diagram

B) Use case diagram

C) Sequence diagram ✓

D) Table of contents

Correct answer: C | Explanation: Sequence diagrams show time-ordered interactions.

اردو وضاحت: UML کے ذریعے سسٹم کو diagram کی شکل میں دکھایا جاتا ہے۔ ہر diagram مختلف پہلو واضح کرتا ہے۔

Q6. Which diagram represents workflow and decisions?

A) Sequence diagram

B) Class diagram

C) Use case diagram

D) Activity diagram ✓

Correct answer: D | Explanation: Activity diagrams model process flow and decisions.

Q7. What does an attribute describe in a class diagram?

A) A property of a class or object ✓

B) A deployment schedule

C) An external user

D) A testing stage

Correct answer: A | Explanation: Attributes describe data held by objects.

Q8. Which is an example of a method?

A) The color of a box

B) open() on a Box object ✓

C) The year of an exam

D) A type of watermark

Correct answer: B | Explanation: Methods represent operations or behaviors.

Q9. What is the purpose of identifying actors in use case modeling?

A) To design hardware

B) To assign website colors

C) To determine system users or external systems ✓

D) To compile a program

Correct answer: C | Explanation: Actors identify who interacts with the system.

Q10. Which notation generally shows a choice in an activity diagram?

A) A page border

B) A page header

C) A plain paragraph

D) A decision diamond ✓

Correct answer: D | Explanation: Diamonds represent decision points in activity diagrams.

اردو وضاحت: UML کے ذریعے سسٹم کو diagram کی شکل میں دکھایا جاتا ہے۔ ہر diagram مختلف پہلو واضح کرتا ہے۔

1.6 Introduction to Design Patterns ⭐⭐

Core concept: Design patterns are reusable solutions to recurring software design problems. The chapter introduces Singleton, Factory, Observer, and Strategy patterns, plus their applications to code structure and reuse.

Q1. What is a software design pattern?

A) A reusable solution to a common design problem ✓

B) A type of computer monitor

C) A software license only

D) A network cable

Correct answer: A | Explanation: Patterns provide established approaches to recurring problems.

اردو وضاحت: Design patterns عام مسائل کے دوبارہ استعمال ہونے والے حل ہیں، مثلاً Observer تبدیلی پر متعلقہ افراد کو اطلاع دیتا ہے۔

Q2. Which pattern is intended to permit one instance of a class?

A) Observer

B) Singleton ✓

C) Strategy

D) Factory

Correct answer: B | Explanation: Singleton controls creation so one instance is shared.

Q3. Which pattern helps create objects without exposing all creation details?

A) Observer

B) Strategy

C) Factory ✓

D) Sequence

Correct answer: C | Explanation: Factory separates object creation from its use.

Q4. Which pattern notifies interested objects when a subject changes?

A) Singleton

B) Factory

C) Strategy

D) Observer ✓

Correct answer: D | Explanation: Observer supports subscription and notification.

Q5. Which pattern lets the program choose among alternative algorithms?

A) Strategy ✓

B) Singleton

C) Observer

D) Factory

Correct answer: A | Explanation: Strategy encapsulates alternative behaviors.

اردو وضاحت: Design patterns عام مسائل کے دوبارہ استعمال ہونے والے حل ہیں، مثلاً Observer تبدیلی پر متعلقہ افراد کو اطلاع دیتا ہے۔

Q6. Which pattern suits a single shared configuration manager?

A) Observer

B) Singleton ✓

C) Factory

D) Strategy

Correct answer: B | Explanation: A configuration manager can be maintained as one instance.

Q7. Which pattern might notify followers about a new post?

A) Singleton

B) Strategy

C) Observer ✓

D) Factory

Correct answer: C | Explanation: Observers receive updates after a subject changes.

Q8. Why are design patterns used?

A) To eliminate all coding

B) To replace requirements

C) To ban testing

D) To improve reuse and maintainability ✓

Correct answer: D | Explanation: Patterns can improve design clarity and reusability.

Q9. Which pattern is suitable for producing different types of reports?

A) Factory ✓

B) Observer

C) Singleton

D) Sequence

Correct answer: A | Explanation: A factory can centralize report-object creation.

Q10. Which choice best represents the Strategy pattern?

A) One fixed object for all purposes

B) Switchable payment calculation methods ✓

C) Automatically notify subscribers

D) Draw actors and use cases

Correct answer: B | Explanation: Strategy allows selecting an algorithm for a task.

اردو وضاحت: Design patterns عام مسائل کے دوبارہ استعمال ہونے والے حل ہیں، مثلاً Observer تبدیلی پر متعلقہ افراد کو اطلاع دیتا ہے۔

1.7 Software Debugging and Testing ⭐⭐⭐

Core concept: Debugging locates and corrects software bugs; testing checks whether software satisfies its requirements. The chapter introduces unit, integration, system, and acceptance testing, plus tools such as debuggers, print statements, and code reviews.

Q1. What is debugging?

A) Checking printer ink

B) Finding and fixing program errors ✓

C) Designing a brochure

D) Releasing software without tests

Correct answer: B | Explanation: Debugging investigates and corrects bugs.

اردو وضاحت: Debugging غلطی تلاش اور درست کرتا ہے؛ Testing سافٹ ویئر کے درست کام کرنے کی جانچ ہے۔

Q2. What is unit testing?

A) Testing all branches at once

B) Testing customer satisfaction only

C) Testing an individual component ✓

D) Testing hardware packaging

Correct answer: C | Explanation: Unit tests focus on a small testable part.

Q3. Which testing checks interaction between modules?

A) Acceptance testing

B) Unit testing only

C) Color testing

D) Integration testing ✓

Correct answer: D | Explanation: Integration tests verify combined component interactions.

Q4. Which testing examines the application as a whole?

A) System testing ✓

B) Syntax highlighting

C) Unit testing only

D) Code formatting

Correct answer: A | Explanation: System tests assess the entire integrated application.

Q5. Who typically checks software against end-user expectations during acceptance testing?

A) Only the compiler

B) Users or clients ✓

C) Only the network router

D) Only the printer

Correct answer: B | Explanation: Acceptance verifies whether delivered software meets needs.

اردو وضاحت: Debugging غلطی تلاش اور درست کرتا ہے؛ Testing سافٹ ویئر کے درست کام کرنے کی جانچ ہے۔

Q6. Which debugging approach prints values during execution?

A) Version control

B) Deployment

C) Print statements ✓

D) Requirement interviews

Correct answer: C | Explanation: Print statements expose runtime values.

Q7. What does a debugger help a developer do?

A) Change the school syllabus

B) Print books

C) Draw only a logo

D) Inspect execution and variables ✓

Correct answer: D | Explanation: Debuggers help locate faults during program execution.

Q8. Which is an example of a code review?

A) Another developer inspects code for issues ✓

B) The user changes the wallpaper

C) The student checks a keyboard

D) The editor changes the document font

Correct answer: A | Explanation: Reviews can spot code defects before release.

Q9. Why is testing necessary?

A) To guarantee software never needs maintenance

B) To evaluate whether requirements are met ✓

C) To replace the design phase

D) To avoid user needs

Correct answer: B | Explanation: Testing checks expected behavior and quality.

Q10. What is the usual progression from narrow to broader testing?

A) System, unit, integration

B) Acceptance, unit, system

C) Unit, integration, system, acceptance ✓

D) Deployment, design, unit

Correct answer: C | Explanation: Testing can progress from components to full product acceptance.

اردو وضاحت: Debugging غلطی تلاش اور درست کرتا ہے؛ Testing سافٹ ویئر کے درست کام کرنے کی جانچ ہے۔

1.8 Software Development Tools ⭐⭐

Core concept: Development tools assist with writing, translating, running, debugging, and managing code. The chapter covers language editors, translators, debuggers, IDEs, online/offline environments, and source code repositories.

Q1. What is the main use of a code editor?

A) Designing a classroom

B) Writing and editing source code ✓

C) Installing only hardware

D) Printing examination papers

Correct answer: B | Explanation: Code editors help create and modify code.

اردو وضاحت: Code editor کوڈ لکھنے، compiler/interpreter اسے چلانے، debugger غلطیاں تلاش کرنے اور repository کوڈ محفوظ کرنے میں مدد دیتی ہے۔

Q2. Which tool commonly translates code line by line?

A) Compiler

B) Debugger

C) Interpreter ✓

D) Repository

Correct answer: C | Explanation: Interpreters execute code stepwise as described in the chapter.

Q3. Which tool typically translates an entire program before execution?

A) Debugger

B) Code editor

C) Version control

D) Compiler ✓

Correct answer: D | Explanation: Compilers translate complete programs to executable form.

Q4. What does IDE stand for?

A) Integrated Development Environment ✓

B) Internet Data Exchange

C) Internal Debugging Engine

D) Integrated Digital Editor

Correct answer: A | Explanation: IDEs combine programming-related tools.

Q5. Which is an IDE mentioned in the chapter?

A) Notepad++ only

B) Visual Studio ✓

C) An HDMI cable

D) A PDF watermark

Correct answer: B | Explanation: Visual Studio is a full integrated development environment.

اردو وضاحت: Code editor کوڈ لکھنے، compiler/interpreter اسے چلانے، debugger غلطیاں تلاش کرنے اور repository کوڈ محفوظ کرنے میں مدد دیتی ہے۔

Q6. Which tool helps trace mistakes in source code?

A) Font manager

B) Spreadsheet

C) Debugger ✓

D) Scanner

Correct answer: C | Explanation: A debugger helps developers identify errors.

Q7. Which is an example of a source code repository platform?

A) PowerPoint

B) Keyboard Manager

C) Paint

D) GitHub ✓

Correct answer: D | Explanation: GitHub hosts repositories for projects.

Q8. What is a benefit of source code repositories?

A) Track changes and collaborate ✓

B) Avoid writing any software

C) Replace all testing

D) Eliminate team communication

Correct answer: A | Explanation: Repositories provide version history and collaboration support.

Q9. Which platform type requires internet/cloud access in the chapter?

A) Offline platform

B) Online platform ✓

C) Local compiler only

D) Desktop text editor only

Correct answer: B | Explanation: Online environments are accessed through the internet.

Q10. Which environment typically runs locally on a developer computer?

A) Cloud service only

B) Remote browser only

C) Offline development platform ✓

D) Internet search engine

Correct answer: C | Explanation: Offline development can use local tools without the internet.

اردو وضاحت: Code editor کوڈ لکھنے، compiler/interpreter اسے چلانے، debugger غلطیاں تلاش کرنے اور repository کوڈ محفوظ کرنے میں مدد دیتی ہے۔

SECTION 7 | Textbook exercise and examination provenance

The uploaded textbook includes exercise MCQs on SDLC purpose, performance requirements, frameworks, Agile sprints, planning, cost estimation and use case diagrams. It also includes short and long questions on requirements, testing, integration, risk, UML, patterns and development tools.

Exercise answer key (textbook PDF page 21, printed page 18): 1—b; 2—b; 3—b; 4—b; 5—a; 6—c; 7—b.

Note: The exercise key above refers only to the textbook's seven questions, not to the independently created study-bank questions. No historical board examination year can be attributed from this source.

Expected board-style focus, not a prediction of actual papers: SDLC phases; functional versus non-functional requirements; Waterfall versus Agile; project cost and risk; UML diagram differences; four design patterns; levels of testing; and development tools.

SECTION 9 | Chapter practice test — no marked answers

Instructions: Attempt MCQs independently. Each MCQ has only one correct option. Then answer ten short and three long questions. Use Section 10 to check MCQs.

1. Which diagram emphasizes messages over time?

A) Class diagram B) Use case diagram

C) Sequence diagram D) Table of contents

2. What does an attribute describe in a class diagram?

A) A property of a class or object B) A deployment schedule

C) An external user D) A testing stage

3. Which is an example of a method?

A) The color of a box B) open() on a Box object

C) The year of an exam D) A type of watermark

4. What is a software design pattern?

A) A reusable solution to a common design problem B) A type of computer monitor

C) A software license only D) A network cable

5. Which pattern notifies interested objects when a subject changes?

A) Singleton B) Factory

C) Strategy D) Observer

6. Which is an example of a technical project risk?

A) A font preference B) A staff birthday

C) Server failure D) A logo color

7. A student builds a calculator application. This is an example of what?

A) Software development B) Hardware assembly

C) Network cabling D) Document printing

8. What is the usual progression from narrow to broader testing?

A) System, unit, integration B) Acceptance, unit, system

C) Unit, integration, system, acceptance D) Deployment, design, unit

9. What does risk mitigation mean?

A) Estimating screen resolution B) Reducing the impact of identified risks

C) Writing user stories only D) Deleting the schedule

10. Which choice best represents the Strategy pattern?

A) One fixed object for all purposes B) Switchable payment calculation methods

C) Automatically notify subscribers D) Draw actors and use cases

11. Which is a non-functional requirement?

A) The system supports 1,000 users B) Users can register

C) Users can search books D) Staff can add inventory

12. Which debugging approach prints values during execution?

A) Version control B) Deployment

C) Print statements D) Requirement interviews

13. Which model is generally suitable when requirements are stable?

A) Rapid iteration B) Unplanned development

C) Frequent requirement changes D) Waterfall

14. Which approach commonly responds better to changing requirements?

A) Waterfall only B) Neither approach

C) Agile D) Hardware design

15. Who typically checks software against end-user expectations during acceptance testing?

A) Only the compiler B) Users or clients

C) Only the network router D) Only the printer

16. In pair programming, how many developers work together at one workstation?

A) Two B) One hundred

C) Zero D) Ten

17. Which tool typically translates an entire program before execution?

A) Debugger B) Code editor

C) Version control D) Compiler

18. Which is an example of a code review?

A) Another developer inspects code for issues B) The user changes the wallpaper

C) The student checks a keyboard D) The editor changes the document font

19. Which stage makes the software available to users?

A) Requirement gathering B) Design

C) Testing D) Deployment

20. Which methodology uses sequential development phases?

A) Agile B) Scrum

C) Waterfall D) Pair programming

SECTION 10 | Practice-test answer key

Question	Answer	Reason
1	C	Sequence diagrams show time-ordered interactions.
2	A	Attributes describe data held by objects.
3	B	Methods represent operations or behaviors.
4	A	Patterns provide established approaches to recurring problems.
5	D	Observer supports subscription and notification.
6	C	Technology failures can disrupt delivery.
7	A	Building a calculator application is software creation.
8	C	Testing can progress from components to full product acceptance.
9	B	Mitigation is a response plan to limit risk.
10	B	Strategy allows selecting an algorithm for a task.
11	A	Capacity is a quality/performance constraint.
12	C	Print statements expose runtime values.
13	D	Stable, well-defined requirements suit Waterfall.
14	C	Agile is designed for adapting through iterations.
15	B	Acceptance verifies whether delivered software meets needs.
16	A	Pair programming uses two developers collaborating.
17	D	Compilers translate complete programs to executable form.
18	A	Reviews can spot code defects before release.

19	D	Deployment installs or releases the working system.
20	C	Waterfall progresses through defined phases.

Short and long question model answers are provided in Sections 5 and 6.

Prepared for Raytech Institute | Curriculum based on the uploaded first-year PECTAA textbook. Independent revision aid; not an official board publication.

Source and verification register

Textbook: Computer Science and Entrepreneurship 11, PECTAA; uploaded Chapter 1, printed pages 1–19. The original exercise occupies printed pages 18–19.

Official 2027 smart syllabus and model paper: https://pectaa.edu.pk/wp-content/uploads/2026/11/ALP-Notification-Grade-11.pdf

Verified past-board appearances: None established from authenticated, year-specific board question papers during this preparation. “Not verified” is not evidence that the question never appeared.

Board-wise verified repetition summary

MCQ topic	Importance	Boards	Verified years	Occurrences
SDLC requirements	⭐⭐⭐	Not verified	Not verified	Not verified
Agile sprints	⭐⭐⭐	Not verified	Not verified	Not verified
Project planning	⭐⭐⭐	Not verified	Not verified	Not verified
Design patterns	⭐⭐	Not verified	Not verified	Not verified
UML / section 1.5 (2027 excluded)	Supplementary	Not verified	Not verified	Not verified

This table deliberately does not invent historical repetition frequencies. Topic priorities reflect textbook learning outcomes, the current exam structure, and the official model paper, not audited historical counts.

Top 20 high-priority revision MCQ concepts

1. Purpose of SDLC — instructional priority; past-paper occurrence not verified.

2. Framework versus library — instructional priority; past-paper occurrence not verified.

3. Requirement gathering — instructional priority; past-paper occurrence not verified.

4. Functional requirements — instructional priority; past-paper occurrence not verified.

5. Non-functional requirements — instructional priority; past-paper occurrence not verified.

6. Performance versus functionality — instructional priority; past-paper occurrence not verified.

7. Design stage deliverables — instructional priority; past-paper occurrence not verified.

8. Implementation stage — instructional priority; past-paper occurrence not verified.

9. Functionality and compatibility testing — instructional priority; past-paper occurrence not verified.

10. Deployment and maintenance — instructional priority; past-paper occurrence not verified.
11. Waterfall stages — instructional priority; past-paper occurrence not verified.
12. When Waterfall is suitable — instructional priority; past-paper occurrence not verified.
13. Agile iterations and sprints — instructional priority; past-paper occurrence not verified.
14. Continuous integration — instructional priority; past-paper occurrence not verified.
15. Benefits of incremental feedback — instructional priority; past-paper occurrence not verified.
16. Cost estimation factors — instructional priority; past-paper occurrence not verified.
17. Risk identification and mitigation — instructional priority; past-paper occurrence not verified.

18. Quality assurance — instructional priority; past-paper occurrence not verified.

19. Singleton and Factory patterns — instructional priority; past-paper occurrence not verified.

20. Unit versus integration testing — instructional priority; past-paper occurrence not verified.

Original textbook exercise — answer key and status

Exercise MCQ 1: answer B. Retained in the 2027 chapter exercise. Source: uploaded textbook, printed page 18.

Exercise MCQ 2: answer B. Retained in the 2027 chapter exercise. Source: uploaded textbook, printed page 18.

Exercise MCQ 3: answer B. Retained in the 2027 chapter exercise. Source: uploaded textbook, printed page 18.

Exercise MCQ 4: answer B. Retained in the 2027 chapter exercise. Source: uploaded textbook, printed page 18.

Exercise MCQ 5: answer A. Retained in the 2027 chapter exercise. Source: uploaded textbook, printed page 18.

Exercise MCQ 6: answer C. Retained in the 2027 chapter exercise. Source: uploaded textbook, printed page 18.

Exercise MCQ 7: answer B. EXCLUDED from 2027 (official ALP). Source: uploaded textbook, printed page 18.

2027 model paper: status clarification

PECTAA provides three Chapter 1 model MCQs in its 2027 specimen paper on the themes of Singleton, sprints and non-functional requirements. This is a MODEL PAPER, not an administered board exam. Exact board/year repetitions: not verified. Consult the official specimen PDF for its exact statements and option order.