UNITED INSTITUTE OF TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE | Affiliated to Anna University |
Accredited by NAAC with A+ Grade | Certified by ISO 9001:2015)
Periyanaickenpalayam, Coimbatore – 641020

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK

III YEAR

EVEN SEMESTER

ACADEMIC YEAR 2024-2025

INDEX

HEAD OF THE DEPARTMENT

ACOE **PRINCIPAL** **CHAIRMAN**

CCS356

OBJECT ORIENTED SOFTWARE ENGINEERING

UNIT I SOFTWARE PROCESS AND AGILE DEVELOPMENT				
Introduction to Software Engineering, Software Process, Perspective and Specialized Process Models –Introduction to Agility-Agile process-Extreme programming-XP Process-Case Study.				
PART A				
Q.NO	**QUESTION**	**CO**	**BTL**	**MARK**
1.	What is software engineering? What are its application?	1	1	2
2.	Write the IEEE definition of software engineering.	1	2	2
3.	Define the terms product and process in software engineering.	1	1	2
4.	Software doesn't wear out. Justify.	1	2	2
5.	Why software architecture is important in software process?	1	2	2
6.	What are the umbrella activities of a software process?	1	1	2
7.	List two deficiencies in waterfall model. Which process model do you suggest to overcome each efficiency?	1	2	2
8.	How does "Project Risk" factor affect the spiral model of software development?	1	2	2
PART – B				
1.	Define software life cycle. List all life cycle models and explain all the models in detail with neat diagram.	1	4	16
2.	What is process model? Describe the process model that you would choose to manufacture a car. Explain by giving suitable reasons.	1	1	16
3.	Discuss the Extreme Programming Process. What are some of the issues that leads to an XP debate?	1	6	16
4.	List the principles of agile software development.	1	3	16

UNIT II REQUIREMENTS ANALYSIS AND SPECIFICATION

Requirement analysis and specification – Requirements gathering and analysis – Software Requirement Specification – Formal system specification – Finite State Machines – Petrinets – Object modelling using UML – Use case Model – Class diagrams – Interaction diagrams – Activity diagrams – State chart diagrams – Functional modelling – Data Flow Diagram- CASE TOOLS.

PART – A

Q.NO	QUESTION	CO	BTL	MARK
1.	Write distinct steps in requirement engineering process.	2	1	2
2	Why SRS must be traceable? What is traceability requirement?	2	1	2
3.	List the characteristics of good SRS.	2	2	2
4.	Define functional and non- functional requirements.	2	1	2
5.	Define feasibility study and list the types.	2	1	2
6.	What is the purpose of petrinet?	2	2	2
7.	Draw the context flow graph of a ATM automation system.	2	2	2
8.	What are all the various types of diagram that can be drawn in UML .	2	2	2
	PART – B			
1.	Explain the software requirement engineering process with neat diagram .	2	5	16
2.	What are the components of the standard structure for the software requirement document? Explain in detail. (Or) Show the template of IEEE standard software requirement document.	2	5	16

3.	Explain Petri Net in details. Draw a Petri Net that depicts the operation of an "Automated Teller Machine". State the functional requirements you are considering.	2	6	16
4.	Draw Sequence and collaboration diagram for online course reservation system.	2	6	16

UNIT III SOFTWARE DESIGN

Software design – Design process – Design concepts – Coupling – Cohesion – Functional independence – Design patterns – Model-view-controller – Publish-subscribe – Adapter – Command – Strategy – Observer – Proxy – Facade – Architectural styles – Layered – Client Server – Tiered Pipe and filter- User interface design-Case Study.

PART – A

Q.NO	QUESTION	CO	BTL	MARK
1.	What are the Characteristics of Good Design? What are the steps involved in design stage of a software?	3	1	2
2	Define data abstraction.	3	1	2
3.	What are certain issues that are considered while designing the software?	3	2	2
4.	Name the levels of abstraction, which are in practice for the design	3	2	2
5.	What are the architectural design various system models can be used?	3	2	2
6.	Define Coupling and Cohesion.	3	1	2
7.	In what way abstraction differs from refinement?	3	1	2
8.	Define Refactoring.	3	1	2

PART – B

1.	Explain architecture styles of a. Client server b. Tiered architecture c. Layered architecture.	3	5	16
2.	Discuss about pipe and filter architectural pattern.	3	6	16
3.	Explain strategy design pattern for any scenario with neat class diagram.	3	5	16

4.	Explain core activities involved in user interface design process with necessary block diagram..	3	5	16

UNIT IV SOFTWARE TESTING AND MAINTENANCE

Testing – Unit testing – Black box testing– White box testing – Integration and System testing– Regression testing – Debugging – Program analysis – Symbolic execution – Model Checking-Case Study

PART – A

Q.NO	QUESTION	CO	BTL	MARK
1.	What are the principles of testing?	4	1	2
2	Difference between testing and debugging.	4	2	2
3.	Write short note on debugging techniques.	4	1	2
4.	Difference between black and white box testing.	4	2	2
5.	Define cyclomatic complexity.	4	1	2
6.	How will you test simple loop?	4	3	2
7.	List the errors identified during unit testing.	4	3	2
8.	What is static program analysis?	4	1	2
PART – B				
1.	Explain equivalence portioning techniques with suitable example.	4	5	16
2.	Discuss about validation testing methods.	4	6	16
3.	Write short note on a. Regression testing b. Smoke testing	4	4	16
4.	With suitable example explain boundary value analysis.	4	5	16

UNIT V PROJECT MANAGEMENT				
Software Project Management- Software Configuration Management – Project Scheduling- DevOps: Motivation-Cloud as a platform-Operations- Deployment Pipeline: Overall Architecture Building and Testing-Deployment- Tools- Case Study.				
PART A				
Q.NO	**QUESTION**	**CO**	**BTL**	**MARK**
1.	How to measure the function point (FP)?	5	2	2
2	What is error tracking?	5	2	2
3.	List a few process and project metrics.	5	1	2
4.	Mention difference between organic mode and embedded mode in cocomo model.	5	2	2
5.	List two advantages of COCOMO model.	5	2	2
6.	State the advantages and disadvantages in LOC based cost estimation.	5	2	2
7.	What are the different types of productivity estimation measures?	5	2	2
8.	State any two project scheduling techniques.	5	1	2
PART – B				
1.	(i)What are the categories of stakeholders? What are the characteristics of effective project manager? (ii)Explain W5HHH principle.	5	5	16
2.	Explain the overall architecture of DevOps?	5	5	16
3.	Explain the role of people, product and process in project management.	5	5	16
4.	Describe in detail COCOMO model for software cost estimation. Illustrate considering a suitable example.	5	4	16

----- END ----

CS3691

EMBEDDED SYSTEMS AND IoT

UNIT I

8-BIT EMBEDDED PROCESSOR

8-Bit Microcontroller – Architecture – Instruction Set and Programming – Programming Parallel Ports – Timers and Serial Port – Interrupt Handling.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	Define microcontroller. and its applications.	1	1	2
2.	Differentiate microprocessor and microcontroller.	1	1	2
3.	Interpret Embedded Systems and its components.	1	1	2
4.	List Embedded Systems addressing modes.	1	2	2
5.	Which register has the SMOD bit, and what is its status when the 8051 is powered up?	1	1	2
6.	List the 8051 interrupts with its priority?	1	1	2
7.	Define the operating model 0 of 8051 serial ports.?	1	2	2
8.	Give the format of the register PSW of 8051 and name each it.	1	1	2
	PART B			
1.	Explain the Block diagram of 8051 ? or Explain the architecture of 8051?	1	4	8 8
2.	For microcontroller discuss the following : (i)How RAM is organized and addressed ? (ii)How many register banks are present in RAM and how is bank switching executed ?	1	4	8 8
3.	List the various instructions available in 8051 microcontroller.	1	2	16
4.	Describe the different modes of operation of Timer/Counter in 8051 with its associated registers (or)Explain the timer modes of 8051 microcontroller ?	1	2	16

UNIT II
EMBEDDED C PROGRAMMING

Memory And I/O Devices Interfacing – Programming Embedded Systems in C – Need For RTOS – Multiple Tasks and Processes – Context Switching – Priority Based Scheduling Policies.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is embedded C Programing?	1	1	2
2.	What is Raspberry PI ? and its types	1	1	2
3.	List the advantages and limitations of Priority based process scheduling.	1	1	2
4.	Define context switching in RTOS ?	1	2	2
5.	Bring out the difference between multiple process and multiple task ?	1	1	2
6.	What is RTOS ?	1	1	2
7.	What are Arduino – Operators?	1	2	2
8.	Define Sketch.	1	1	2
	PART B			
1.	Write Embedded C program for generating LED output sequence as shown below 00000001,00000010,00000100,00001000 so on till 10000000.	2	4	8 8
2.	Explain the context switching mechanism for moving the CPU from one executing process to another with an example ?	2	4	8 8
3.	Briefly explain the Multiple Tasks and Processes?	2	2	16
4.	Explain priority scheduling and its types with example also explain its characterstics.	2	2	16

UNIT III

IOT AND ARDUINO PROGRAMMING

Introduction to the Concept of IOT Devices – IOT Devices Versus Computers – IOT Configurations – Basic Components – Introduction to Arduino – Types of Arduino – Arduino Toolchain – Arduino Programming Structure – Sketches – Pins – Input/Output From Pins Using Sketches – Introduction to Arduino Shields – Integration of Sensors and Actuators with Arduino.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	Draw the logic design of IOT and describe its components?	3	1	2
2.	Draw the logic design of IOT and describe its components?	3	1	2
3.	What are the different protocols of IoT?	3	1	2
4.	Define IOT	3	1	2
5.	Point out the challenges faced by Internet of Things.	3	1	2
6.	What are the types of shields?	3	1	2
7.	Define I2C	3	1	2
8.	Why Linux OS used in Raspberry pi?	3	1	2
	PART B			
1.	Briefly explain the Technical Building blocks of IoT,	3	4	16
2.	Describe the Communication Technologies of IOT	3	5	16
3.	Explain about Arduino shieds	3	5	16
4.	Explain the Sensors and sensor Node and interfacing using any Embedded target boards RaspberryPi	3	5	16

UNIT IV

IOT COMMUNICATION AND OPEN PLATFORMS

IOT Communication Models and APIs – IOT Communication Protocols – Bluetooth – WiFi – ZigBee – GPS – GSM modules – Open Platform (like Raspberry Pi) – Architecture – Programming – Interfacing – Accessing GPIO Pins – Sending and Receiving Signals Using GPIO Pins – Connecting to the Cloud.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is Zigbee?	4	1	2
2.	What is Piconet?	4	1	2
3.	What is GSM/GPRS module?	4	1	2
4.	Define NFC	4	1	2
5.	Define Home Location Register (HLR)	4	1	2
6.	What is SMS Gateway (SMS-G)?	4	1	2
7.	What is Operation and Support Subsystem (OSS)?	4	1	2
8.	Define Equipment Identity Register (EIR)	4	1	2
	PART B			
1.	Explain GSM services and its architecture in detail	4	4	16
2.	Explain IOT communication Protocols with neat diagram.	4	4	16
3.	Brief about Bluetooth architecture.	4	5	16
4.	Explain GPS in detail.	4	4	16

UNIT V
APPLICATIONS DEVELOPMENT

Complete Design of Embedded Systems – Development of IOT Applications – Home Automation – Smart Agriculture – Smart Cities – Smart Healthcare.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is an Embedded System Design?	5	1	2
2.	Write the Types of Embedded Systems	5	1	2
3.	What are the challenges of Embedded Systems?	5	1	2
4.	What are sensors and Actuators	5	1	2
5.	What is MQTT Protocol?	5	1	2
6.	Define Signal Conditioning Unit.	5	1	2
7.	Write the applications of IOT in Smart Supply Chain	5	1	2
8.	Write the Disadvantages of Embedded System	5	1	2
	PART B			
1.	Explain the Complete Design of Embedded Systems and development of IOT applications	5	4	16
2.	Write a program for Home Automation and explain.	5	4	16
3.	Write a program for smart Agriculture and explain with relevant diagram	5	4	16
4.	Write a program Smart Cities and explain	5	4	16

----- END ----

CCS335

CLOUD COMPUTING

UNIT I

CLOUD ARCHITECTURE MODELS AND INFRASTRUCTURE

Cloud Architecture: System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture – Cloud deployment models – Cloud service models; Cloud Infrastructure: Architectural Design of Compute and Storage Clouds – Design Challenges

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	What are the five essential characteristics of cloud computing according to NIST?	1	1	2
2.	List the three main service models defined by the NIST Cloud Computing Reference Architecture.	1	1	2
3.	Name the four main cloud deployment models.	1	1	2
4.	What is a hybrid cloud, and how is it beneficial?	1	2	2
5.	Which cloud deployment model is most cost-effective for small businesses? Why?	1	2	2
6.	Define scalability in the context of cloud computing.	1	2	2
7.	Why is elasticity important for handling dynamic workloads in cloud systems?	1	2	2
8.	How do latency and bandwidth issues affect cloud computing performance?	1	2	2

PART - B

1.	Explain the cloud service models (IaaS, PaaS, SaaS) and their applications in various domains.	1	5	16
2.	Discuss the NIST Cloud Computing Reference Architecture and its significance in cloud computing.	1	5	16

3.	Analyze the role of cloud deployment models in meeting diverse business needs, with a focus on public, private, hybrid, and community clouds.	1	5	16
4	Illustrate the importance of cloud service models in enabling efficient resource utilization and scalability, and discuss their impact on the IT industry.	1	5	16

UNIT II

VIRTUALIZATION BASICS

Virtual Machine Basics – Taxonomy of Virtual Machines – Hypervisor – Key Concepts – Virtualization structure – Implementation levels of virtualization – Virtualization Types: Full Virtualization – Para Virtualization – Hardware Virtualization – Virtualization of CPU, Memory and I/O devices.

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	Define a virtual machine.	2	2	2
2.	Define virtualization.	2	2	2
3.	What is full virtualization?	2	2	2
4.	Define para-virtualization.	2	2	2
5.	List the implementation levels of virtualization.	2	1	2
6.	What is the difference between Guest OS and Host OS?	2	2	2
7.	Name the two types of hypervisors.	2	1	2
8.	What is a hypervisor?	2	2	2
	PART B			
1.	What is a Hypervisor? Explain its types and the significance of each type in virtualization	2	2	16

2.	Describe the different implementation levels of virtualization.	2	2	16
3.	Differentiate between Full Virtualization and Para Virtualization. Provide advantages and disadvantages of each.	2	2	16
4	Explain how virtualization is achieved for CPU, memory, and I/O devices. Illustrate with relevant examples.	2	2	16

UNIT III

VIRTUALIZATION INFRASTRUCTURE AND DOCKER

Desktop Virtualization – Network Virtualization – Storage Virtualization – System-level of Operating Virtualization – Application Virtualization – Virtual clusters and Resource Management – Containers vs. Virtual Machines – Introduction to Docker – Docker Components – Docker Container – Docker Images and Repositories.

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	What is desktop virtualization?	3	2	2
2	Define storage virtualization.	3	2	2
3.	What is system-level virtualization in operating systems?	3	2	2
4.	What is application virtualization?	3	2	2
5.	What is the main purpose of network virtualization?	3	2	2
6.	What is Docker?	3	2	2
7.	What is a Docker container?	3	2	2
8.	What is a Docker image?	3	2	2

1.	Discuss the concept of Desktop Virtualization.	3	2	16
2.	Explain Storage Virtualization and its role in data management.	3	2	16
3.	Explain the concept of Virtual Clusters and Resource Management in cloud computing.	3	2	16
4	Explain Docker Containers, Images, and Repositories.	3	2	16

UNIT IV

CLOUD DEPLOYMENT ENVIRONMENT

Google App Engine – Amazon AWS – Microsoft Azure; Cloud Software Environments – Eucalyptus – OpenStack.

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	Summarize the Service Offerings by AWS	4	2	2
2.	Depict the benefits of OpenStack Compute	4	2	2
3.	What do you mean by open cloud ecosystem	4	2	2
4.	Write the procedure to deploy the application in Google App Engine	4	2	2
5.	What is MS Azure	4	2	2
6.	What are the benefits of using Amazon AWS	4	2	2
7.	Identify the key services provided by MZ Azure	4	1	2
8.	What is OpenStack	4	2	2

PART – B

1.	Discuss Amazon AWS and MS Azure	4	2	16
2.	Draw and explain the architecture of Eucalyptus	4	2	16
3.	What is Google App Engine? Describe the major building blocks and functional modules of the Google Cloud Platform with a diagram	4	2	16
4	Breakdown the architecture of OpenStack and explain how its components interact.	4	2	16

UNIT V

CLOUD SECURITY

Virtualization System-Specific Attacks: Guest hopping – VM migration attack – hyperjacking. Data Security and Storage; Identity and Access Management (IAM) - IAM Challenges - IAM Architecture and Practice.

PART A

Q.NO	QUESTION	CO	BTL	MARK
1.	What is Hyper jacking attack	5	2	2
2.	List out the IAM challenges	5	1	2
3.	What is guest hopping in virtualization security	5	2	2
4.	What are the common virtualization system specific attacks	5	2	2
5.	What is the purpose of identify and access Management	5	2	2
6.	Define VM Migration attack	5	2	2
7.	Describe the role of IAM in cloud security	5	2	2
8.	List out the key components of data security and storage in cloud environments	5	1	2

PART – B				
1.	List the virtualization system specific attacks and explain any two of them	5	2	16
2.	Write a note about guest hopping and VM Migration attacks. Provide real time case studies for the same	5	2	16
3.	Write a detailed note on cloud security	5	2	16
4	What is Identity and Access Management? Describe its architecture. Depict the procedure to carry out IAM in AWS cloud platform.	5	2	16

----- END ----

CCS366

SOFTWARE TESTING AND AUTOMATION

UNIT-1

FOUNDATIONS OF SOFTWARE TESTING

Why do we test Software?, Black-Box Testing and White-Box Testing, Software Testing Life Cycle, V-model of Software Testing, Program Correctness and Verification, Reliability versus Safety, Failures, Errors and Faults (Defects), Software Testing Principles, Program Inspections, Stages of Testing: Unit Testing, Integration Testing, System Testing

PART-A

Q.NO	QUESTIONS	CO	BTL	MARK
1.	Define software testing.	1	1	2
2.	Compare and contrast the objectives of Black-Box Testing and White-Box Testing.	1	2	2
3.	What is the Software Testing Life Cycle (STLC)?	1	1	2
4.	What is the V-model of software testing?	1	1	2
5.	Differentiate between verification and validation	1	2	2
6.	What is software testing principles?	1	2	2
7.	What is the primary goal of a Formal Technical Review (FTR) during program inspections?	1	1	2
8.	What is the purpose of "Acceptance Testing" in the system testing phase?	1	1	2
	PART-B			
1.	Explain the concepts of Black-Box Testing and White-Box Testing, highlighting their differences and use cases.	1	2	16
2.	Describe the key phases and activities in the Software Testing Life Cycle (STLC) and their importance in ensuring a robust testing process.	1	2	16
3.	Explain the V-Model of Software Testing, how it differs from traditional development approaches, and its role in promoting early defect detection.	1	4	16
4.	Describe the three stages of testing—Unit Testing, Integration Testing, and System Testing—and their respective objectives and challenges.	1	2	16

UNIT-II

TEST PLANNING

The Goal of Test Planning, High Level Expectations,Intergroup Responsibilities, Test Phases, Test Strategy, Resource Requirements, Tester Assignments, Test Schedule, Test Cases, Bug Reporting, Metrics and Statistics

PART-A

Q.NO	QUESTION	CO	BT L	MARK
1.	What is the primary goal of test planning in the software testing process?	2	1	2
2.	Why is it essential to have a structured and organized set of test cases for a software application?	2	2	2
3.	What is the purpose of a test strategy in software testing, and how does it guide the testing process?	2	1	2
4.	What is the importance of well-defined tester assignments in software testing?	2	2	2
5.	What is the primary purpose of a bug report in software testing?	2	1	2
6.	Explain the concept of "mean time to failure" (MTTF) in the context of software reliability testing, and discuss its significance for measuring software stability.	2	2	2
7.	What is the primary purpose of bug reporting in the software testing process?	2	1	2
8.	How do testing metrics like defect density influence decision-making in software testing projects?	2	1	2
	PART-B			
1.	Provide an example of a test case that belongs to the system testing phase of the software testing life cycle.	2	5	16

2.	Compare and contrast the roles and responsibilities of testers and developers in the bug reporting and resolution process. What are the challenges that can arise from misalignment in these roles, and how can they be mitigated?	2	5	16
3.	Discuss the role of effective communication between testers and developers in the bug reporting and resolution process. What strategies can be employed to enhance collaboration and reduce communication barriers?	2	5	16
4.	Explain the concept of "mean time to failure" (MTTF) in software testing. How is it calculated, and what insights does it provide into software reliability? Provide examples of situations where MTTF is particularly useful.	2	2	16

UNIT III
TEST DESIGN AND EXECUTION

Test Objective Identification, Test Design Factors, Requirement identification, Testable Requirements, Modeling a Test Design Process, Modeling Test Results, Boundary Value Testing, Equivalence Class Testing, Path Testing, Data Flow Testing, Test Design Preparedness Metrics, Test Case Design Effectiveness, Model-Driven Test Design, Test Procedures, Test Case Organization and Tracking, Bug Reporting, Bug Life Cycle

PART-A

Q.NO	QUESTION	CO	BT L	MARK
1.	What is the purpose of test objective identification in the software testing process?	3	1	2
2.	What is path testing, and how does it differ from other testing techniques?	3	2	2
3.	What is the purpose of modeling test results, and how does it contribute to test documentation?	3	2	2
4.	What is boundary value testing, and why is it an important testing technique?	3	2	2
5.	What is the concept of data flow testing and its relevance to identifying defects	3	2	2
6.	Define test case design effectiveness and its relationship to testing efficiency.	3	1	2

7.	What tools or software are commonly used for tracking test cases and their execution status?	3	1	2
8.	What is the process of bug reporting and its significance in software testing?	3	2	2
	PART-B			
1.	Explain the process of identifying test objectives in the context of a complex software project. How do these objectives evolve throughout the project lifecycle, and why is it important to adapt them as needed?	3	2	16
2.	Define the concept of testable requirements and discuss their role in test case design. Provide examples of requirements that are easy to test and those that pose challenges, and explain why.	3	5	16
3.	Describe the principles and challenges of path testing, particularly in large and complex software systems. How does path testing ensure thorough code coverage, and what strategies can be employed to manage the complexity of path testing effectively?	3	3	16
4.	Explain the methodology of data flow testing and its role in identifying defects related to data handling. Provide a practical example of data flow testing in a software system, including the identification of data flow paths and the creation of test cases.	3	5	16

UNIT IV
ADVANCED TESTING CONCEPTS

Performance Testing: Load Testing, Stress Testing, Volume Testing, Fail-Over Testing, Recovery Testing, Configuration Testing, Compatibility Testing, Usability Testing, Testing the Documentation, Security testing, Testing in the Agile Environment, Testing Web and Mobile Applications.

PART-A

Q.NO	QUESTION	CO	BT L	MARK
1.	What is load testing?	4	1	2

2.	Why is compatibility testing crucial for web applications?	4	2	2
3.	What is the role of a "Scrum Master" in Agile testing, and how does it contribute to the testing process?	4	1	2
4.	What are the different types of security testing, and can you provide an example of each?	4	2	2
5.	What is the significance of "continuous integration" (CI), and how does it impact software quality?	4	1	2
6.	How does TDD contribute to Agile software development practices?	4	2	2
7.	What is the role of "acceptance criteria" in Agile user stories and how they guide testing efforts?	4	2	2
8.	What is cross-browser testing?	4	1	2
PART-B				
1.	Explain how you would simulate and measure the performance impact of rapidly growing data volume on a web service.	4	4	16
2.	Explain in detail about configuration testing.	4	4	16
3.	Design an Agile testing plan for a mobile app development project, incorporating sprint cycles, user stories, and acceptance criteria.	4	5	16
4.	Describe the challenges associated with testing online help documentation, and how they differ from testing printed documentation.	4	5	16

UNIT V
TEST AUTOMATION AND TOOLS

Automated Software Testing, Automate Testing of Web Applications, Selenium: Introducing Web Driver and Web Elements, Locating Web Elements, Actions on Web Elements, Different Web Drivers, Understanding Web Driver Events, Testing: Understanding Testing.xml, Adding Classes, Packages, Methods to Test, Test Reports.

PART-A

Q.NO	QUESTION	CO	BT L	MARK
1.	What is automated software testing?	5	2	2

2.	What is regression testing, and how does automation benefit it?	5	2	2
3.	What is Selenium WebDriver?	5	1	2
4.	What is the CSS selector, and how can you use it to locate web elements?	5	2	2
5.	Name some of the popular web browsers supported by Selenium WebDriver.	5	1	2
6.	What is the purpose of adding packages to a TestNG suite in a testing.xml file?	5	2	2
7.	What is the role of assertions in automated testing for web applications?	5	2	2
8.	What are test reports in the context of test automation?	5	1	2
PART-B				
1.	Elaborate on the key considerations when deciding which test cases to automate in a software testing project.	1	5	16
2.	How does the process of automating testing for web applications differ from other software applications, and what unique challenges arise when dealing with web elements and web pages?	1	5	16
3.	Explore the concept of parallel test execution in Selenium, including how it can be managed, the benefits of parallel testing, and the challenges associated with running multiple tests concurrently.	1	5	16
4.	Explain in detail about different web drivers.	1	5	16

----- END ----

CCS332

APP DEVELOPMENT

UNIT – 1 FUNDAMENTALS OF MOBILE & WEB APPLICATION DEVELOPMENT				
Basics of Web and Mobile application development, Native App, Hybrid App, Cross-platform App, What is Progressive Web App, Responsive Web design.				
PART - A				
Q.NO	**QUESTION**	**CO**	**BTL**	**MARKS**
1.	Define web application.	1	1	2
2	Explain the flow of web application.	1	2	2
3.	Define Mobile App development	1	1	2
4.	Compare Native app and Hybrid app on the basis of Native App Hybrid App	1	4	2
5.	What is cross platform App?	1	1	2
6.	Define Progressive web apps	1	1	2
7.	Why you should include responsive design in your website?	1	1	2
8.	How To Design a Responsive Website in Eight Steps	1	1	2
PART - B				
1.	Design the web app for hospital management with necessary items.	1	6	16
2.	A retail company wants to improve the in-store shopping experience for its customers. Design it by using native app	1	6	16
3.	List the simulators and emulators in mobile application.	1	4	16
4.	Tabulate the difference between simulators & emulators	1	4	16

UNIT II NATIVE APP DEVELOPMENT USING JAVA				
Native Web App, Benefits of Native App, Scenarios to create Native App, Tools for creating Native App, Cons of Native App, Popular Native App Development Frameworks, Java &Kotlin for Android, Swift & Objective-C for iOS, Basics of React Native, Native Components, JSX, State, Props				
PART - A				
Q.NO	**QUESTION**	**CO**	**BTL**	**MARKS**
1.	What is React Native?	2	1	2
2	List some popular tools for developing native apps	2	1	2

3.	Give the Pros and cons of Native app	2	2	2
4.	Define Mobile App Development Framework	2	1	2
5.	What is Kotlin and Why Do We Use it?	2	1	2
6.	Define swift in ios.	2	1	2
7.	What is JSX?	2	1	2
8.	What are Components in React?	2	1	2
PART - B				
1.	Explain the Scenarios to create Native App with example	2	5	16
2.	Create a Popular Native App Development Frameworks using Java & Kotlin.	2	6	16
3.	Explain the basics of Basics of React Native, Native Components, JSX, State, Props.	2	5	16
4.	Explain the tools for creating native app.	2	5	16

UNIT III
HYBRID APP DEVELOPMENT

Hybrid Web App, Benefits of Hybrid App, Criteria for creating Native App, Tools for creating Hybrid App, Cons of Hybrid App, Popular Hybrid App Development Frameworks, Ionic, Apache Cordova

PART - A

Q.NO	QUESTION	CO	BT L	MARKS
1.	What is Hybrid App Development?	3	1	2
2	List the example of hybrid app development	3	1	2
3.	List the key features of Native, hybrid and web app	3	1	2
4.	List the advantage of hybrid app development	3	1	2
5.	List of hybrid mobile application development frameworks with their pros and cons.	3	1	2
6.	Pros of using Flutter Development Framework	3	4	2

7.	Define Ionic.	3	1	2
8.	Pros and Cons using Ionic Development Framework	3	4	2
	PART – B			
1.	Explain Hybrid Web App, Benefits of Hybrid App, Criteria for creating Native App with example.	3	5	16
2.	Create Hybrid App for real time application.	3	6	16
3.	Explain the frameworks, Ionic, Apache Cordova in detail with example.	3	5	16
4.	Explain the tools of hybrid app.	3	5	16

UNIT IV
CROSS-PLATFORM APP DEVELOPMENT USING REACT-NATIVE

What is Cross-platform App, Benefits of Cross-platform App, Criteria for creating Cross-platform App, Tools for creating Cross-platform App, Cons of Cross-platform App, Popular Cross-platform App Development Frameworks, Flutter, Xamarin, React-Native, Basics of React Native, Native Components, JSX, State, Props.

PART - A

Q.NO	QUESTION	CO	BT L	MARKS
1.	List the two frameworks in cross platform Architecture?	4	1	2
2	Difference between Native vs. cross-platform development.	4	4	2
3.	List the tools creating Cross-platform App and programming languages support for it	4	1	2
4.	How to develop cross-platform mobile apps?	4	1	2
5.	How do you choose the right cross-platform app development framework for your project?	4	1	2
6.	Future of cross-platform app development	4	1	2
7.	What is JSX?	4	1	2
8.	What is the tool supported to develop a Facebook app?	4	1	2
	PART – B			
1.	Illustrate the Criteria for creating Cross-platform App.	4	2	16

2.	Differentiate Native vs Hybrid vs Cross-Platform.	4	4	16
3.	Discuss about the Flutter Architecture in detail.	4	6	16
4.	Write down the steps to create simple Hello world App in Xamerin.	4	5	16

UNIT V
NON-FUNCTIONAL CHARACTERISTICS OF APP FRAMEWORKS

Comparison of different App frameworks, Build Performance, App Performance, Debugging capabilities, Time to Market, Maintainability, Ease of Development, UI/UX, Reusability.

PART - A

Q.NO	QUESTION	CO	BTL	MARKS
1.	Give real time App developed with Flutter?	5	1	2
2	Difference between React Native and Flutter?	5	4	2
3.	What is Mobile Angular UI?	5	1	2
4.	Mobile app performance KPIs to measure app quality	5	3	2
5.	List the metrics of app performance.	5	1	2
6.	List the functional aspects of debugging capabilities	5	1	2
7.	What is Reusability in app framework?	5	1	2
8.	Define easy development in app framework	5	1	2

PART - B

1.	Differentiate Xamarin, React Native and Flutter framework.	5	4	16
2.	Write down the steps to debug in android.	5	5	16
3.	Explain ways to reduce time to market in product development.	5	5	16
4.	Differentiate UI and UX	5	4	16

----- END ----

CCS374

WEB APPLICATION SECURITY

UNIT I
FUNDAMENTALS OF WEB APPLICATION SECURITY

The history of Software Security-Recognizing Web Application Security Threats, Web Application Security, Authentication and Authorization, Secure Socket layer, Transport layer Security, Session Management-Input Validation

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	What is the significance of recognizing web application security threats?	1	1	2
2	Define Web Application Security.	1	1	2
3.	Differentiate between Authentication and Authorization.	1	2	2
4.	What is Secure Socket Layer (SSL)?	1	1	2
5.	What are the role of a Web Application firewall (WAF)?	1	2	2
6.	What is Cross-Origin Resource Sharing (CORS), and why is it relevant to web application security?	1	1	2
7.	Define Distributed Denial of Service (DDoS) attack.	1	1	2
8.	What is the concept of Clickjacking?	1	2	2
	PART - B			
1.	Explain the various authentication mechanisms commonly employed in web applications, along with their strengths and weaknesses. Compare and contrast session-based and token- based authentication methods.	1	2	16
2.	Describe the components and processes involved in Secure Socket Layer (SSL) and Transport Layer Security (TLS), elucidating how they ensure secure communication over the internet.	1	5	16
3.	Analyze the impact of common web application security threats such as Cross-Site Scripting (XSS), SQL Injection, and Cross-Site Request Forgery (CSRF) on the security posture of web applications. Propose mitigation strategies to address these threats effectively.	1	4	16

4	Examine the role of Web Application firewalls (WAFs) in protecting web applications from various threats, including SQL Injection, DDoS attacks, and malicious bots. Compare the effectiveness of network-based and host-based WAF deployments in different scenarios.	1	4	16

UNIT II
SECURE DEVELOPMENT AND DEPLOYMENT

Web Applications Security - Security Testing, Security Incident Response Planning,The Microsoft Security Development Lifecycle (SDL), OWASP Comprehensive Lightweight Application Security Process (CLASP), The Software Assurance Maturity Model (SAMM)

PART - A				
Q.NO	**QUESTION**	**CO**	**BTL**	**MARK**
1.	What is the purpose of security testing in web applications?	2	1	2
2	What is Microsoft Security Development Lifecycle (SDL)?	2	1	2
3.	Define OWASP CLASP.	2	1	2
4.	Define Software Assurance Maturity Model (SAMM)	2	1	2
5.	What are the name a widely used tool for security testing in web applications?	2	1	2
6.	What are the key considerations for effective Security Incident Response Planning?	2	1	2
7.	What is the phases of the Microsoft Security Development Lifecycle?	2		2
8.	What are some advantages of implementing Microsoft SDL?	2	1	2
PART - B				
1.	Compare and contrast the Microsoft Security Development Lifecycle (SDL) and OWASP Comprehensive Lightweight Application	2	5	16
	Security Process (CLASP) in terms of their approaches, methodologies, and effiectiveness in enhancing web application security.			

2.	Explain the process of security testing in web applications, highlighting its importance in ensuring robust security measures.	2	2	16
3.	Evaluate the strengths and weaknesses of the OWASP Comprehensive Lightweight Application Security Process (CLASP) and its applicability in diverse software development environments. Provide recommendations for overcoming potential limitations.	2	5	16
4	Assess the effectiveness of the Software Assurance Maturity Model (SAMM) in improving software security across different stages of the development lifecycle. Discuss its impact on organizational security practices and its alignment with industry standards and best practices	2	6	16

UNIT III
SECURE API DEVELOPMENT

API Security- Session Cookies, Token Based Authentication, Securing Natter APIs: Addressing threats with Security Controls, Rate Limiting for Availability, Encryption, Audit logging, Securing service-to-service APIs: API Keys , OAuth2, Securing Microservice APIs: Service Mesh, Locking Down Network Connections, Securing Incoming Requests.

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	What is the purpose of session cookies in API security?	3	1	2
2	What is the role of encryption in API security?	3	1	2
3.	Why is audit logging important in API security?	3	1	2
4.	How are incoming requests secured in API development?	3	1	2
5.	What is the concept of token-based authentication in API security?	3	2	2
6.	What is OAuth2, and how does it contribute to securing APIs?	3	1	2
7.	What are the primary security benefits of using a service mesh in microservice architectures?	3	2	2
8.	How can network connections be locked down to enhance API security?	3	1	2

PART - B

1.	Discuss the role of session cookies and token-based authentication in securing APIs. Compare and contrast their implementation, security implications, and suitability for different use cases in web application development.	3	6	16
2.	Evaluate the effectiveness of different authentication mechanisms, including API keys and OAuth2, in securing service-to-service APIs. Discuss their strengths, weaknesses, and suitability for various deployment scenarios, considering factors such as scalability, manageability, and security requirements.	3	5	16
3.	Explore the challenges and benefits of securing microservice APIs using a service mesh architecture. Discuss how service mesh technologies facilitate secure communication, traffic management, and observability in distributed microservice environments, and assess their impact on overall system reliability and security posture.	3	5	16
4	Analyze the importance of locking down network connections in API security. Discuss strategies for implementing network-level security measures such as firewalls, network segmentation, and access control policies to protect API endpoints from unauthorized access and malicious attacks.	3	5	16

UNIT IV
VULNERABILITY ASSESSMENT AND PENETRATION TESTING

Vulnerability Assessment Lifecycle, Vulnerability Assessment Tools: Cloud-based vulnerability scanners, Host-based vulnerability scanners, Network-based vulnerability scanners, Database- based vulnerability scanners, Types of Penetration Tests: External Testing, Web Application Testing, Internal Penetration Testing, SSID or Wireless Testing, Mobile Application Testing.

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	What is the Vulnerability Assessment Lifecycle?	4	1	2

2	What is the primary purpose of network-based vulnerability scanners?	4	1	2
3.	What is the primary objective of Mobile Application Testing in penetration testing?	4	1	2
4.	What are the stages involved in the Vulnerability Assessment Lifecycle?	4	1	2
5.	What is Network-based vulnerability scanners?	4	1	2
6.	What are the types of penetration test?	4	1	2
7.	What is web application testing? And its types.	4	1	2
8.	What is the primary objective of Mobile Application Testing in penetration testing?	4	1	2
	PART - B			
1.	Discuss the Vulnerability Assessment Lifecycle in detail, outlining each stage's significance and activities involved. Provide examples of tools and techniques commonly used in each stage to effiectively identify, remediate, and verify vulnerabilities within an organization's infrastructure.	4	6	16
2.	Compare and contrast various types of vulnerability assessment tools, including cloud-based, host-based, network-based, and database-based scanners. Evaluate their strengths, weaknesses, and suitability for diffierent environments and scenarios, considering factors such as scalability, accuracy, and ease of use.	4	4	16
3.	Explore the importance of penetration testing in identifying and mitigating security risks within an organization's infrastructure. Discuss the diffierent types of penetration tests, including External Testing, Web Application Testing, Internal Penetration Testing, SSID or Wireless Testing, and Mobile Application Testing, and provide examples of when each type should be employed.	4	6	16
4	Evaluate the significance of Mobile Application Testing in penetration testing and its role in identifying security vulnerabilities in mobile applications and their interaction with backend services. Discuss common security challenges faced by mobile applications,	4	5	16

	and provide strategies for securing mobile applications against potential threats.			

UNIT V
HACKING TECHNIQUES AND TOOLS

Social Engineering, Injection, Cross-Site Scripting(XSS), Broken Authentication and Session Management, Cross-Site Request Forgery, Security Misconfiguration, Insecure Cryptographic Storage, Failure to Restrict URL Access, Tools: Comodo, OpenVAS, Nexpose, Nikto, Burp Suite, etc.

PART - A				
Q.NO	**QUESTION**	**CO**	**BTL**	**MARK**
1.	What is Social Engineering in the context of hacking?	5	1	2
2	What type of attack is commonly associated with injecting malicious code into databases?	5	1	2
3.	What vulnerability is exploited when sensitive data is stored in an insecure manner?	5	1	2
4.	What role does Burp Suite play in thefield of cybersecurity?	5	1	2
5.	Define Social Engineering and its significance in cybersecurity.	5	1	2
6.	What are the common types of injection attacks, and how do they exploit vulnerabilities?	5	1	2
7.	What are the importance of secure cryptographic storage in protecting sensitive data?	5	2	2
8.	What is the impact of Cross-Site Scripting (XSS) attacks on web applications and users?	5	2	2
PART - B				
1.	Explore the techniques and psychological principles behind Social Engineering attacks, and discuss their effiectiveness in bypassing traditional cybersecurity defenses. Provide real-world examples of Social Engineering attacks and analyze their impact on organizations and individuals.	5	6	16

2.	Discuss the various types of injection attacks, including SQL injection, LDAP injection, and XML injection, and explain how they exploit vulnerabilities in web applications. Evaluate the severity of	5	6	16
	injection attacks in terms of potential damage and provide recommendations for mitigating these risks.			
3.	Analyze the prevalence of Cross-Site Scripting (XSS) vulnerabilities in web applications and their impact on security. Discuss the diffierent types of XSS attacks, such as reflected XSS, stored XSS, and DOM-based XSS, and provide strategies for detecting, preventing, and mitigating XSS vulnerabilities.	5	4	16
4	Evaluate the risks associated with broken authentication and session management vulnerabilities in web applications. Discuss common causes of these vulnerabilities, such as weak passwords, sessionfixation, and insufficient session expiration policies, and provide best practices for improving authentication and session management security.	5	5	16

----- END ----

OEE351

RENEWABLE ENERGY SYSTEM

UNIT 1 RENEWABLE ENERGY SYSTEMS				
Environmental consequences of fossil fuel use, Importance of renewable sources of energy, Sustainable Design and development, Types of RE sources, Limitations of RE sources, Present Indian and international energy scenario of conventional and RE sources.				
PART- A				
Q.NO	**QUESTION**	**CO**	**BTL**	**MARKS**
1.	What are Renewable Energy Systems? What are the applications	1	1	2
2	How does Renewable Energy be different from Non Renewable differ?	1	2	2
3.	Define sources of Renewable Energy.	1	1	2
4.	How does Fossil Fuel differ from Natural source? Justify	1	2	2
5.	What are the limitations of renewable energy source?	1	2	2
6.	Can we call Fossil Fuels as part of RES? Justify the answer	1	1	2
7.	Is Atmospheric Pollution termed as RES or Non RES? Why & How	1	2	2
8.	What are the Environmental Issues of Acid Rain?	1	2	2
PART- B				
1.	Define TEDA and how is it useful?	1	4	16
2.	India uses about 500 million T of coal every year to produce electricity, about 3.6 trillion cubic feet of natural gas for power, chemicals and fertilizers and over 160 million T of oil for transport and Industry. Comment .	1	1	16
3.	What is Greenhouse effect? Can Mumbai experience this? Justify	1	6	16
4.	How can RES be termed as Reliable and Resiliant?.	1	3	16

UNIT II WIND ENERGY				
Power in the Wind – Types of Wind Power Plants (WPPs)–Components of WPPs-Working of WPPs-Sighting of WPPs-Grid integration issues of WPPs.				
PART- A				
Q.NO	**QUESTION**	**CO**	**BTL**	**MARKS**
1.	Define Wind Power or Wind Energy	2	1	2

2	How is wind caused? What are wind turbines and how do they work?	2	1	2
3.	What is the process of converting air motion to electricity called as?	2	2	2
4.	How are the wind power plants based on? Give details.	2	1	2
5.	What are wind farms?	2	1	2
6.	Define uneven solar heating?	2	2	2
7.	What is Coriolis Effect?	2	2	2
8.	What is an idealized atmospheric circulation	2	2	2
PART- B				
1.	Explain Coriolis Force in detail	2	5	16
2.	Most of the modern wind mills have 3 blades. Why	2	5	16
3.	Explain the wind power parameters in detail	2	6	16
4.	Define Lanchester Betz limit in detail	2	6	16

UNIT III
SOLAR PV AND THERMAL SYSTEMS

Solar Radiation, Radiation Measurement, Solar Thermal Power Plant, Central Receiver Power Plants, Solar Ponds.- Thermal Energy storage system with PCM- Solar Photovoltaic systems : Basic Principle of SPV conversion – Types of PV Systems- Types of Solar Cells, Photovoltaic cell concepts: Cell, module, array ,PV Module I-V Characteristics, Efficiency & Quality of the Cell, series and parallel connections, maximum power point tracking, Applications

PART- A

Q.NO	QUESTION	CO	BTL	MARKS
1.	Define solar radiation.	3	1	2
2	Infer solar azimuth angle and zenith angle	3	1	2
3.	Express the estimation of average solar radiation?	3	2	2
4.	State the principle involved in generating solar power.	3	2	2
5.	Examine the working principle of pyranometer.	3	2	2
6.	Describe the solar thermal power plant.	3	1	2
7.	Express the advantage of solar concentrators	3	1	2

8.	Explain the Solar Photovoltaic systems.	3	1	2
	PART–B			
1.	Explain the in detail about the solar radiation phenomena.	3	5	16
2.	What are the reasons for variation in the amount of solar energy reaching earth surface.	3	6	16
3.	Explainstrategydesignpattern foranyscenario withneat class diagram.	3	5	16
4.	Explain the working of thermal energy storage system with PCM.	3	5	16

UNIT IV
BIOMASS ENERGY

Introduction-Bio mass resources –Energy from Bio mass: conversion processes-Biomass Cogeneration-Environmental Benefits. Geothermal Energy: Basics, Direct Use, Geothermal Electricity. Mini/micro hydro power: Classification of hydropower schemes, Classification of water turbine, Turbine theory, Essential components of hydroelectric system.

PART- A

Q.NO	QUESTION	CO	BTL	MARKS
1.	Name the constituents of biogas	4	1	2
2	What is geothermal energy?	4	2	2
3.	Describe Geothermal gradient.	4	1	2
4.	Explain the concept of wet steam geothermal system..	4	2	2
5.	Define hydroelectric power plant.	4	1	2
6.	Give the necessity of surge tank in hydropower plant.	4	3	2
7.	Explain the primary requirements for site selection of hydropower plant	4	3	2
8.	Explain two differences between carbon in CO2 from burning coal and from burning biomass.?	4	1	2
	PART–B			
1.	Discuss the following methods of biogas generation i. Gasification ii. Anaerobic Digestion.	4	5	16
2.	With a neat sketch explain the operation dry steam geothermal power plant..	4	6	16
3.	Discuss about selection of water turbine based on capacity of the power plan, head and water flow rate.	4	4	16

4.	Which biomass energy crops and products are (i) most likely, and (ii) least likely to affect food supplies?	4	5	16

UNIT V
OTHER ENERGY SOURCES

Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems. Wave Energy: Energy from waves, wave power devices. Ocean Thermal Energy Conversion (OTEC)- Hydrogen Production and Storage- Fuel cell : Principle of working- various types -construction and applications. Energy Storage System- Hybrid Energy Systems.

PART- A

Q.NO	QUESTION	CO	BTL	MARKS
1.	What is tidal energy?	5	2	2
2	Illustrate the limitations of tidal power generation	5	2	2
3.	Explain the factors determines the maximum length and height of ocean waves..	5	1	2
4.	Give the overall efficiency of an OTEC power plant.	5	2	2
5.	Illustrate OTEC open cycle.	5	2	2
6.	What is hydrogen energy?	5	2	2
7.	Draw the schematic of fuel cell.?	5	2	2
8.	Does the energy carried forward in a deep-water wave travel at the same speed as the wave?	5	1	2
	PART- B			
1.	Explain the different economic and environmental considerations of tidal power plant.	5	5	16
2.	Discuss, what is the minimum tidal range required for the working of tidal plant. Explain how much the potential in tides is.	5	5	16
3.	Discuss the following: i. OTEC open cycle. ii. OTEC closed (Anderson) cycle..	5	5	16
4.	With the help of neat diagram, explain the working of geo thermal-preheat hybrid..	5	4	16

----- END ----

MX3089

INDUSTRIAL SAFETY

UNIT I

SAFETY TERMINOLOGIES

Hazard-Types of Hazard- Risk-Hierarchy of Hazards Control Measures-Lead indicators - lag Indicators - Flammability - Toxicity Time - weighted Average (TWA) - Threshold LimitValue (TLV) - Short Term Exposure Limit (STEL) - Immediately dangerous to life or health (IDLH) - acute and chronic Effects - Routes of Chemical Entry - Personnel Protective Equipment - Health and Safety Policy - Material Safety Data Sheet MSDS.

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	Define the term "hazard."	1	1	2
2	Differentiate between lead and lag indicators with an example for each.	1	2	2
3.	Distinguish between flammability and toxicity.	1	2	2
4.	Define Time-Weighted Average	1	1	2
5.	Differentiate between acute and chronic effects with examples.	1	2	2
6.	Name the four primary routes of chemical entry into the body.	1	1	2
7.	What is the purpose of a Health and Safety Policy?	1	1	2
8.	How does an MSDS help in chemical safety management?	1	2	2
	PART - B			
1.	Explain the types of Hazard in detail.	1	2	16
2.	Analyze the effectiveness of the hierarchy of hazard control measures in reducing risks in a manufacturing plant with toxic fumes and rotating machinery.	1	4	16
3.	Analyze how acute and chronic effects influence the choice of safety measures in handling hazardous chemicals.	1	4	16

4	Evaluate the effectiveness of a health and safety policy in fostering a culture of safety in an organization.	1	5	16

UNIT II

STANDARDS AND REGULATIONS

Indian Factories Act-1948 - Health - Safety- Hazardous materials and Welfare - ISO 45001:2018 health and safety (OH&S) - Occupational Safety and Health Audit IS14489:1998 – Hazard Identification and Risk Analysis - code of practice IS 15656:2006

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	What is the primary objective of the Indian Factories Act, 1948?	2	1	2
2	Name two health provisions under the Indian Factories Act, 1948.	2	1	2
3.	What is the main objective of risk analysis?	2	1	2
4.	List two examples of hazardous materials commonly found in industries.	2	1	2
5.	How does ISO 45001:2018 differ from traditional safety practices?	2	2	2
6.	What is IS 14489:1998 related to?	2	1	2
7.	What is the role of HIRA in workplace safety?	2	1	2
8.	How does IS 15656:2006 contribute to industrial safety?	2	2	2
	PART - B			
1.	Explain the key provisions of the Indian Factories Act, 1948 relatedto health, safety, hazardous materials, and worker welfare. How do these provisions ensure a safe working environment?	2	4	16

2.	Discuss the key principles of ISO 45001:2018 and its role in occupational health and safety management. How does it help organizations improve workplace safety?	2	4	16
3.	What is the significance of IS 14489:1998 in occupational safety audits? Describe the steps involved in conducting a workplace safety audit as per this standard.	2	4	16
4	Develop a Hazard Identification and Risk Analysis (HIRA) framework based on IS 15656:2006 for a manufacturing plant. How would you implement risk control measures to minimize workplace hazards?	2	6	16

UNIT III

SAFETY ACTIVITIES

Toolbox Talk- Role of safety Committee- Responsibilities of Safety Officers and Safety Representatives- Safety Training and Safety Incentives- Mock Drills- On-site Emergency Action Plan- Off-site Emergency Action Plan- Safety poster and Display- Human Error Assessment.

PART A

Q.NO	QUESTION	CO	BTL	MARK
1.	What is the primary function of a safety committee?	3	1	2
2	What are two responsibilities of a safety officer in an organization?	3	2	2
3.	How does a safety representative contribute to workplace safety?	3	2	2
4.	Give two examples of safety incentives used to encourage safe behavior	3	2	2
5.	What is the purpose of conducting a mock drill?	3	2	2
6.	What is the significance of safety posters in the workplace?	3	2	2
7.	What is meant by human error in workplace safety?	3	2	2

8.	Name two methods used to assess human error in industrial settings	3	2	2
PART - B				
1.	Explain the structure and functions of a safety committee in an organization. How does it contribute to workplace safety?	3	4	16
2.	Discuss the importance of safety training programs in an industrial setting. How do safety incentives encourage a culture of safety?	3	5	16
3.	Design a comprehensive emergency action plan for an industrial plant, including both on-site and off-site measures. What challenges might arise during	3	6	16
	implementation?			
4	Analyze different types of human errors in the workplace. How can organizations assess and minimize the risk of human errors affecting safety?	3	4	16

UNIT – IV

WORKPLACE HEALTH AND SAFETY

Noise hazard- Particulate matter- musculoskeletal disorder improper sitting poster and lifting Ergonomics RULE & REBA- Unsafe act & Unsafe Condition- Electrical Hazards- Crane Safety- Toxic gas Release

PART - A

Q.NO	QUESTION	CO	BTL	Marks
1.	State how prolonged exposure to high noise levels can affect human health.	4	2	2
2	Define particulate matter and give an example of its source.	4	2	2
3.	Identify two ergonomics solutions to prevent musculoskeletal disorders caused by improper lifting.	4	2	2

4.	Compare RULE and REBA in terms of their application in ergonomic risk assessment.	4	2	2
5.	Differentiate between an unsafe act and an unsafe condition with examples.	4	2	2
6.	State two safety measures to prevent crane related accidents on a construction site.	4	2	2
7.	Why grounding and insulation are essential to prevent electrical hazards in the workplace?	4	2	2
8	Name two toxic gases commonly released in industrial accidents and their primary health effects.	4	2	2

PART B				
1.	Discuss the various types of electrical hazards in the workplace. What precautions and safety measures should be taken to prevent electrical accidents?	4	2	16
2.	Illustrate how to apply REBA to identify and mitigate ergonomic risk in various job tasks.	4	3	16
3.	Explain the impact of improper sitting posture and incorrect lifting techniques on musculoskeletal health. Suggest ergonomic solutions to prevent such disorders.	4	2	16
4	What are the causes and consequences of toxic gas release in industries? Discuss control measures, emergency response strategies and the role of safety regulations in preventing such incidents.	4	2	16

UNIT V

HAZARD IDENTIFICATION TECHNIQUES

Job Safety Analysis-Preliminary Hazard Analysis-Failure mode and Effects Analysis- Hazard and Operability- Fault Tree Analysis- Event Tree Analysis Qualitative and Quantitative Risk Assessment- Checklist Analysis- Root cause analysis- What-If Analysis- and Hazard Identification and Risk Assessment

PART - A

Q.NO	QUESTION	CO	BTL	MARK
1.	What is Job Safety Analysis (JSA), and why is it important?	5	1	2
2	Define Preliminary Hazard Analysis (PHA) and mention its primary purpose.	5	1	2
3.	List two key objectives of Failure Mode and Effects Analysis (FMEA).	5	2	2
4.	How does a Hazard and Operability Study (HAZOP) help in process safety?	5	2	2
5.	Differentiate between Fault Tree Analysis (FTA) and Event Tree Analysis (ETA).	5	2	2

6.	Explain the purpose of Qualitative and Quantitative Risk Assessment in workplace safety	5	3	2
7.	How does Checklist Analysis contribute to hazard identification?	5	3	2
8.	Give an example of how Root Cause Analysis (RCA) can be used to prevent future accidents.	5	3	2
PART B				
1.	Describe the key principles of the Job Safety Analysis (JSA) process. What are the main steps involved, and how does this technique help in ensuring workplace safety? Provide examples of how JSA can be applied in different industries.	5	2	16
2.	Explain the importance of Failure Mode and Effects Analysis (FMEA) in the context of risk management. How does this method contribute to the identification of potential failures and the prevention of system breakdowns? Provide an example of how FMEA is used in a high-risk industry such as aerospace or manufacturing	5	3	16
3.	Apply the principles of Hazard and Operability Study (HAZOP) to analyze the potential risks involved in a chemical processing plant. How would you identify deviations in the process and suggest appropriate safeguards to prevent hazardous events? Discuss how the HAZOP process can be applied to ensure safety in complex industrial systems.	5	4	16
4	Design a comprehensive risk management plan for a construction project that involves multiple stakeholders and complex processes. Synthesize various risk assessment methods such as Fault Tree Analysis (FTA), Event Tree Analysis, and Root Cause Analysis to develop a holistic framework for identifying, analyzing, and mitigating risks. What strategies would you incorporate to ensure that safety and operational efficiency are maintained throughout the project lifecycle?	5	4	16

----- END ----