CMR Technical Campus

B. Tech Mid Question Bank (R22 Regulation)

Academic Year:2025-26   **Semester: VI**

Subject Name: Software Testing Methodologies

Faculty Name: A UDAY KIRAN, K Supriya Suhasini, J Shiva

PART-A

Q. No	Questions	BL	CO	Unit No
1	Define Testing, what is the purpose of Testing? Explain the consequences of bugs.	BL2	CO1	I
2	What is Pesticide Paradox?	BL2	CO1	I
3	Define Path Testing and Code Coverage.	BL2	CO1	I
4	List the various bug hypothesis.	BL1	CO1	I
5	What is Transaction flow testing? Give example?	BL1	CO2	II
6	What is a domain? Explain Open and Closed Domains.	BL2	CO2	II
7	List various Data Flow Anomalies.	BL3	CO2	II
8	What are the possible Domain Bugs for one Dimensional Open Domain Boundary?	BL1	CO2	II
9	Define Path Sum, Path Product and Path Expression.	BL2	CO3	III
10	Explain node reduction procedure	BL1	CO3	III

PART-B

Q. No	Questions	BL	CO	Unit No
1	List and explain Various Dichotomies.	BL2	CO1	I
2	List and explain various bug hypothesis in detail.	BL1	CO1	I
	Explain in detail about Taxonomy of Bugs.	BL3	CO1	I
3	What are phases in a tester mental Life?	BL2	CO1	I
5	Define path sensitization. Explain Heuristic procedure for sensitizing paths with the help of an Example.	BL3	CO1	I
6	What is meant by program's control flow? How it Useful for path testing?	BL2	CO1	I
7	Explain about domain testing.	BL2	CO2	II
8	Explain domains and testability.	BL2	CO2	II
9	Explain in detail about Nice and Ugly Domains?	BL2	CO2	II

10	Discuss briefly about transaction flow testing techniques	BL2	CO2	II
11	Discuss about: i) Nonlinear domain boundaries ii) Complete domain boundaries	BL2	CO2	II
12	Explain Applications of dataflow testing.	BL2	CO2	II
13	Explain Node Reduction Procedure in detail and with example	BL2	CO3	III
14	Explain Max Path Count with an example?	BL2	CO3	III
15	Define paths, path products and path expressions with suitable examples.	BL3	CO3	III
16	How an Anomaly can be detected? explain different types of data flow Anomaly state graph	BL2	CO3	III

Department of CSE

B. Tech Mid Question Bank (R22 Regulation)
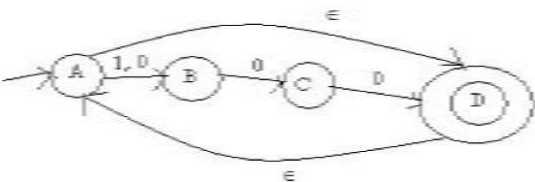
Academic Year: 2025-26 Semester:VI
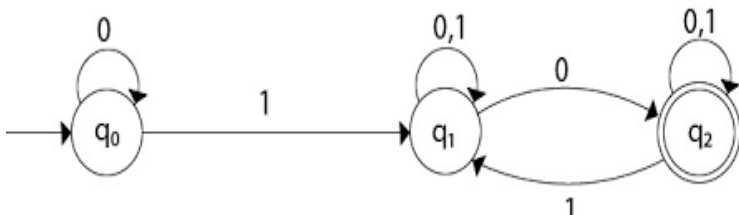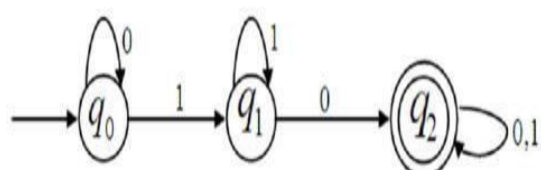
Subject Name:Formal Languages and Automata Theory

Faculty Name: DR. BHASKAR, R SAI KRISHNA,G VINESH SHANKER,TABEEN FATIMA

PART-A

Q.No	Questions	BL	CO	Unit No
1	State The Difference between DFA and NFA with examples.	L2	C01	1
2	Design DFA to accept strings divisible by 5.	L6	C01	1
3	Sketch DFA for L = { w | w has even number of a's } where $\sum$ = {a,b}	L3	C01	1
4	Define transition diagram and transition table with suitable examples.	L1	C01	1
5	Identify whether L = { WW^R | W $\in$ (a,b) *} is regular or not.	L2	C02	2
6	Define regular expression and Write regular expression for L= { $a^{2n}b^{2m+1}$ where m,n>=0}.	L1	C02	2
7	List the applications of regular expressions and state the algebraic laws of regular expressions.	L1	C02	2
8	List the Closure Properties of Regular Languages and Decision Properties of Regular Languages.	L1	C02	2
9	Recall the definition of Context-Free Grammar. Write a suitable example.	L1	C03	3
10	Define ambiguous grammar. Show that the following grammar is ambiguous on the string "aab" S→aS|aSbS|ε	L1	C03	3

PART-B

Q.No	Questions	BL	CO	Unit No
1	Construct a NFA for the given NFA with € moves	L6	CO1	1

2	Draw the transition diagram for the DFA accepting all strings with a substring 10.	L2	CO1	1
3	Construct an DFA for L={a*b*c*} over $\sum$=(a,b,c).	L6	CO1	1
4	Design DFA to accept odd number of a's and even number of b's , where $\sum$=(a,b). show the acceptance of a string with an example.	L6	CO1	1
5	a)DesignDFA for the following $\sum$=(a,b). All string starting with "ab"and ending with "ba". b)construct moore machine that takes all binary numbers as input and prints reside module of 3 as output	L6	CO1	1
6	a)Convert following NFA with epsilon to DFA b)construct melay machine for 2's compliment	L3	CO1	1
7	Prove L={$a^n b^{2n}$ | n>=0} is not regular language using pumping lemma.	L2	CO2	2
8	Construct Minimum state automata for the following. |	a	b | |---|---|---| | $\rightarrow$A | B | A | | B | A | C | | C | D | B | | D (final state) | D | A | | E | D | F | | F | G | E | | G | F | G | | H | G | D |	L6	CO2	2
9	Examine the given regular expression and construct an equivalent minimized DFA. 10+(0+11)0*1	L4	CO2	2
10	Construct the regular expression corresponding to the language accepted by following DFA. 	L6	CO2	2
11	Illustrate the concept of DFA minimization using the given automaton.	L3	CO2	2

12	a)Explain about pumping Lemma Theorem and Determine whether the following language are regular or not with proper justification . L=$\{a^n b^n / n \geq 1\}$ b)Explain Breifly any four closure properties with proof.	L2	CO2	2
13	Explain the components of a Context-Free Grammar with an example.	L2	CO3	3
14	Show that the following grammar is ambiguous E→E+E|E-E|E*E|E/E|(E)|a where E is the start symbol.	L3	CO3	3
15	Analyze the recursive nature of palindromes and construct a Context-Free Grammar that generates all palindromes over {0,1}.	L4	CO3	3
16	Write CFG for the language $\{0^n 1^n / n \geq 1\}$.	L3	CO3	3

Academic Year: 2025-2026   **Semester: VI**

Subject Name: Full Stack Development

Faculty Name: G Pavan Kumar, R Sriniketh

PART-A

Q. No	Questions	BL	CO	Unit No
1	Define Full Stack Development.	L1	CO1	1
2	Classify the components of a basic web development framework.	L2	CO1	1
3	Write a JavaScript function to check whether a number is even or odd.	L1	CO1	1
4	Explain callback function with an example.	L2	CO1	1
5	What is JSON and why is it used in Node.js?	L1	CO2	2
6	Identify request and response objects.	L2	CO2	2
7	Write a Node.js statement to create an HTTP server.	L1	CO2	2
8	Discuss the role of the crypto module.	L2	CO2	2
9	What is NoSQL? Mention one advantage over relational databases.	L1	CO3	3
10	Explain about ObjectId field in MongoDB.	L2	CO3	3

PART-B

Q.No	Questions	BL	CO	Unit No
1	Demonstrate different looping constructs in JavaScript.	L3	CO1	1
2	Examine the structure of a package.json file.	L4	CO1	1
3	Explain Implementation of Passing additional parameters, closure in callbacks and Chaining Callbacks.	L2	CO1	1
4	Describe the Node.js event model.	L2	CO1	1
5	Discuss about EventEmitter, custom events, and event listeners in Node.js	L2	CO1	1
6	Explain JavaScript objects and prototyping.	L2/L3	CO1	1
7	Interpret the Buffer module and its uses	L3	CO2	2
8	Discuss file handling in Node.js	L2	CO2	2
9	Demonstrate processing URLs in Node.js	L3	CO2	2
10	Examine the working of the dns module	L4	CO2	2
11	Explain Implementing HTTP services in Node.js, including URL and query processing	L2	CO2	2

12	Describe the implementation of HTTP and HTTPS servers and clients.	L2/L3	CO2	2
13	Compare SQL and NoSQL databases	L4	CO3	3
14	Explain the structure of a MongoDB document with an example	L2	CO3	3
15	Discuss the steps involved in planning a MongoDB data model.	L2	CO3	3
16	Demonstrate MongoDB shell commands to: Create a database, Create a collection, Insert multiple documents, Display all documents	L3	CO3	3

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B. Tech Mid Question Bank (R22 Regulation)

Academic Year:2025-26   Semester: VI

Subject Name: FUNDAMENTALS OF INTERNET OF THINGS [20EC612OE]

PART-A

Q.No	Questions	BL	CO	Unit No
1	Define the Internet of Things (IoT).list out its characteristics	L1	CO1	1
2	List the functional blocks of an IoT system	L1	CO1	1
3	What is the role of a gateway in IoT networking?.	L1	CO1	1
4	List out the communication protocols used in IoT	L1	CO1	1
5	State one similarity between IoT and M2M.	L1	CO2	2
6	Why is interoperability important in IoT systems?	L2	CO2	2
7	What is Arduino? List out any four features.	L1	CO2	2
8	What is the function of the void setup() function in Arduino?	L1	CO2	2
9	What does the print() function do in Python?	L1	CO3	3
10	State use case of Raspberry Pi in IoT applications.	L1	CO3	3

PART-B

Q.No	Questions	BL	CO	Unit No
1	Explain the physical design of IoT systems	L2	CO1	1
2	Discuss the functional blocks of IoT	L3	CO1	1
3	Evaluate how the integration of functional blocks in a smart agriculture IoT solution	L3	CO1	1
4	Explain the basics of networking in IoT systems	L4	CO1	1
5	Analyze the impact of networking in the context of IoT in healthcare applications.	L3	CO1	1
6	Discuss the role of communication protocols in IoT.	L3	CO1	1
7	Explain the concept of M2M communication and its applications in the energy and healthcare industries.	L2	CO2	2
8	Analyze how M2M communication differs from traditional human-to-machine communication.	L3	CO2	2
9	Compare and contrast IoT and M2M communication.	L3	CO2	2
10	Evaluate how the integration of IoT capabilities extends the functionality of traditional M2M systems in smart cities.	L4	CO2	2
11	Explain the structure of an Arduino program with examples of basic functions like setup() and loop(). Develop a basic Arduino program to blink an LED	L2	CO2	2
12	Explain Integration of Sensors and Actuators with Arduino	L2	CO2	2
13	Explain the key features of Python programming and how they make it suitable for IoT applications.	L2	CO3	3

14	Discuss the hardware and software features of Raspberry Pi in IoT development	L2	CO3	3
15	Analyze how Raspberry Pi can be used to create a low-cost IoT system.	L3	CO3	3
16	Explain the process of interfacing basic peripherals with Raspberry Pi.	L2	CO3	3

Academic Year: 2025-26   **Semester: VI**

Subject Name: BEFA

SL. No	Questions	BL	CO	Unit No
1	Define the Theory of the Firm.	L1	CO1	I
2	What is meant by National Income?	L1	CO1	I
3	State any two features of a Limited Liability Company (LLC).	L2	CO1	I
4	Briefly explain the significance of Economics in business decision-making.	L2	CO1	I
5	Define Elasticity of Demand.	L1	CO2	II
6	State the Law of Supply.	L1	CO2	II
7	Briefly explain any two types of Elasticity of Demand.	L2	CO2	II
8	What is meant by Demand Forecasting? State its importance.	L2	CO2	II
9	List the factors of production.	L1	CO3	III
10	Briefly explain the concept of a Production Function.	L2	CO3	III

PART-B

	Questions	BL	CO	Unit No
1	Explain the structure of a business firm with suitable examples.	L2	CO1	I
2	Illustrate how non-conventional sources of finance help startups and small firms.	L3	CO1	I
3	Apply microeconomic concepts to explain demand and supply decisions of a firm.	L3	CO1	I
4	Analyze the role of a Business Economist in a modern corporate organization.	L4	CO1	I
5	Explain the types of business entities and their suitability for different business situations.	L2	CO1	I
6	Discuss the features and phases of the business cycle and analyze its impact on business decisions.	L4	CO1	I
7	Explain the factors affecting Elasticity of Demand.	L2	CO2	II
8	Illustrate how Elasticity of Demand is useful in business decision-making with suitable examples.	L4	CO2	II
9	Evaluate the suitability of different methods of Demand Forecasting for a manufacturing firm.	L5	CO2	II

10	Apply the concept of the Supply Function to explain changes in supply due to price and non-price factors.	L3	CO2	II
11	Explain the measurement methods and significance of Elasticity of Demand.	L2	CO2	II
12	Analyze the steps and characteristics of good Demand Forecasting and examine its role in managerial planning.	L4	CO2	II
13	Explain the law of returns to scale.	L2	CO3	III
14	Describe the short-run cost functions of a firm.	L2	CO3	III
15	Explain the features of Perfect Competition.	L2	CO3	III
16	Discuss the concept of Break-Even Analysis and its importance.	L2	CO3	III

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B.Tech Mid Question Bank (R22 Regulation)

Academic Year: 2025-2026   **Semester: VI**

Subject Name: Machine Learning(22CS601PC)

Faculty Name: SVSV Prasad Sanaboina, Dr Punyaban Patel, D Sandhya Rani, Chhatre Shital Vitthalrao, CH Sirisha

PART-A

Q.No	Questions	BL	CO	Unit No
1	Define machine learning; list the types of machine learning?	L1	1	1
2	Explain perspectives and issues in machine learning?	L2	1	1
3	Illustrate an activation function?	L2	1	1
4	Solve the classification and Regression Problem with an example?	L3	1	1
5	Compare the Different Output Activation Functions?	L2	2	2
6	Apply The Radial Basic Function Algorithm with an example.	L3	2	2
7	Describe The Cubic Spline?	L1	2	2
8	Describe the Curse of Dimensionality?	L1	2	2
9	Explain the difference between boosting and bagging techniques?	L2	3	3
10	Show how to combine multiple classifiers using voting mechanisms in ensemble learning?	L3	3	3

PART-B

Q.No	Questions	BL	CO	Unit No
1	Explain the Design a Learning System with neat diagram.	L2	1	1
2	Apply the Concept Learning as Task with an example	L3	1	1
3	Analyze the Version Space algorithm with an example	L4	1	1
4	Apply the linear separability with an example	L3	1	1
5	Solve the Candidate Elimination Algorithm for the given dataset	L4	1	1

Dataset for Q5:

Sno	Sky	Temp	Humid	Wind	Water	Forecast	Enjoy Sport?
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	String	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

6	Construct the Linear Regression algorithm	L2	1	1
7	Apply the concept of Radial Basis Functions in machine learning and How are they used in practice.	L3	2	2
8	Explain the Interpolation and basis functions	L2	2	2
9	Analyze the concept of the RBF network?	L4	2	2
10	Discss the basic structure of a Support Vector Machine (SVM). How does it separate classes, and what are the key parameters that influence its performance?	L6	2	2
11	Explain in detail the architecture of a Multi-layer Perceptron (MLP). Discuss how the forward and backward passes work, including the role of weights, biases, and activation functions. Provide an example to illustrate the entire process.	L2	2	2
12	Provide a comprehensive overview of Support Vector Machines (SVM). Discuss the mathematical formulation of SVMs, the concept of the hyperplane, margin maximization, and how SVMs handle non-linearly separable data. Include examples to illustrate your points.	L2	2	2
13	List and explain the advantages and disadvantages of Decision Tree algorithms	L2	3	3
14	Explain the Mixture of Experts Algorithm	L2	3	3
15	Explain the Expectation-Maximisation (EM) Algorithm	L2	3	3
16	Explain the role of entropy and information gain in constructing decision trees.	L2	3	3

Department of Computer Science and Engineering

B.Tech Mid Question Bank (R22 Regulation)

Academic Year: 2025-26   **Semester: VI**

Subject Name: Fundamentals of AI

Faculty Name: Dr.K.Shilpa

PART-A

Q.No	Questions	BL	CO	Unit No
1	Define Artificial Intelligence.	L1	CO1	1
2	Differentiate between Strong AI and Weak AI.	L2	CO1	1
3	List any two benefits of Artificial Intelligence.	L1	CO1	1
4	Describe the Concept of Rationality	L2	CO1	1
5	Define uninformed search strategy.	L1	CO2	2
6	Explain the Breadth-First Search?	L2	CO2	2
7	What is Uniform-Cost Search?	L1	CO2	2
8	Describe the Greedy Best-First Search.	L2	CO2	2
9	What is propositional logic?	L1	CO3	3
10	Describe the First-Order Logic.	L2	CO3	3

PART-B

Q.No	Questions	BL	CO	Unit No
1	Explain the history and evolution of Artificial Intelligence.	L2	CO1	1
2	Discuss the risks associated with Artificial Intelligence.	L3	CO1	1
3	Illustrate rationality in intelligent agents with an example.	L3	CO1	1
4	Compare different types of intelligent agents.	L4	CO1	1
5	Explain intelligent agents and environments. Discuss the structure of agents.	L2	CO1	1
6	Discuss philosophy, ethics, and safety issues in Artificial Intelligence.	L3	CO1	1
7	Explain Breadth-First Search algorithm.	L2	CO2	2
8	Discuss Depth-First Search with an example.	L3	CO2	2
9	Compare IDS and Bidirecional search	L4	CO2	2
10	Explain Uniform-Cost Search.	L2	CO2	2
11	Explain uninformed search strategies in detail.	L2	CO2	2
12	Discuss Greedy Best-First Search and A* Search with examples.	L2	CO2	2
13	Explain knowledge-based agents.	L2	CO3	3
14	Discuss syntax of First-Order Logic.	L3	CO3	3
15	Explain semantics of First-Order Logic.	L2	CO3	3
16	Differentiate propositional logic and First-Order Logic.	L4	CO3	3