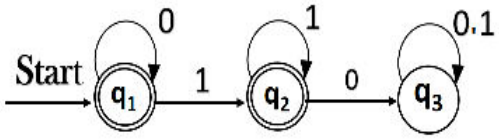
CMR Technical Campus

B. Tech Mid Question Bank (R22 Regulation)

Academic Year:2025-26 Semester: VI

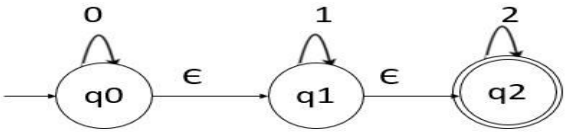
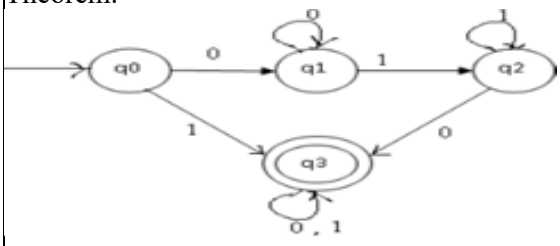
Subject Name: AUTOMATA THEORY AND COMPILER DESIGN
Faculty Name: V. SRISUMA, K.SRINU

PART-A

Q. No	Questions	BL	CO	Unit No
1	Define Finite Automata? List the applications of Automata Theory?	BL1	CO1	I
2	Define the following terms- i. String, ii. Power of Language	BL1	CO1	I
3	Define Kleen closure and Positive closure?	BL1	CO1	I
4	Construct DFA which reads strings from {a,b} and ends with aaa.	BL3	CO1	I
5	Construct the regular expression for the given DFA? 	BL3	CO2	II
6	Define Regular Expression? List the applications of RE.	BL1	CO2	II
7	Construct a FA for the given regular expression (0+1)*(00+11) (0+1)*	BL3	CO2	II
8	Prove that language L={a^nb^n /n>=1} is not regular.	BL4	CO2	II
9	Define a Pushdown Automaton (PDA) and explain its components.	BL1	CO3	III
10	List the approaches to accept a language by PDA.	BL1	CO3	III

PART-B

Q. No	Questions	BL	CO	Unit No
1	Compare DFA and NFA?	BL2	CO1	I
2	Construct DFA accepting the set of all strings containing 101 as a substring.	BL3	CO1	I
3	Construct a DFA, which accepts set of all string over {0,1} which when interpreted as binary number is divisible by '5'.	BL3	CO1	I
4	Construct equivalent DFA for the given NFA? Input/State | A | b →q0 | {q0, q1} | {q0}	BL3	CO1	I

	q1 | **Φ** | {q2} q2* | **Φ** | **Φ**			
5	Construct DFA for the given NFA with epsilon moves. Input/State | 0 | 1 | ε →A | {A, B} | {A} | {C} B | {C} | **Φ** | **Φ** C* | {C} | {C} | {A}	BL3	CO1	I
6	Convert the given NFA with epsilon to NFA without epsilon. 	BL2	CO1	I
7	Construct Finite Automata for the regular Expression 1(01+10)*00.	BL3	CO2	II
8	Obtain a regular expression for the following FA? Input/State | 0 | 1 → A | A | B B | C | B C | A | D D | A | B	BL4	CO2	II
9	Prove that L= $\{a^n b^{2n} \mid n>=0\}$ is not regular language using pumping lemma.	BL5	CO2	II
10	Construct a derivation tree for the string 'abcd' from the grammar: S→aAB, A→bC, B→d, C→cd	BL3	CO2	II
11	Construct RE from given FA by using Arden's Theorem. 	BL3	CO2	II
12	Consider the fallowing grammar G = ({S, A} {a, b}, P, S) Where P consists of S→aB/bA, A→a/aS/bAA, B→b/bS/aBB For the string 'aabbabba' find i. Left Most Derivation ii Right Most Derivation	BL2	CO2	II
13	Design a PDA which accepts set of balanced	BL2	CO3	III

	parentheses. ({{()}}).			
14	Let G be a CFG that generates the set of palindromes given by S→ aSa|bSb|a|b Find the PDA that accepts L(G).	BL2	CO3	III
15	Construct the PDA for the following language. $\{L=a^n b^n \mid n \geq 1\}$	BL3	CO3	III
16	Construct a Turing Machine(TM) that accepts the language $L=\{0^n1^n$|where n>1}	BL3	CO3	III

CMR Technical Campus

B. Tech Mid Question Bank (R22 Regulation)

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

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

Department of INFORMATION TECHNOLOGY

B. Tech Mid Question Bank (R22 Regulation)

Academic Year: 2024-2025 VI Semester

Subject Name: Introduction to Data Science

Faculty Name: Mr RAVI REGULAGADDA & Mr MD SAJID PASHA

PART-A

Q.N	Questions	BL	CO	UN
1	Define Data Science?	L1	1	I
2	Summarize Data Science Hype?	L2	1	I
3	Define Datafication?	L1	1	I
4	Explain R Data Types?	L2	1	I
5	Compare Binary Attributes and Ordinal Attributes?	L2	2	II
6	How to Measure Mean, median, Mode give an Example?	L1	2	II
7	Define IQR with an Example?	L1	2	II
8	Compare Quartile Plot and quartile– quartile plot?	L2	2	II
9	Define array in R?	L1	3	III
10	Define Data Frame in R?	L1	3	III

PART-B

Q.N	Questions	BL	CO	UN
1	Compare Data Hype and Bigdata Hype?	L5	1	I
2	Explain Statistical Inference with Example?	L5	1	I
3	Explain Probability Distribution in Data Science?	L5	1	I
4	Explain Underfitting and Overfitting?	L5	1	I
5	Explain the concept of statistical inference and its importance in Data Science. How do populations and samples play a role in this process?	L5	1	I
6	Describe the process of fitting a statistical model to data. What are the key steps involved, and how can overfitting be avoided?	L5	1	I
7	Discuss the different types of attributes in data analysis.	L5	2	II
8	Discuss the differences between discrete and continuous attributes and their importance in statistical modelling	L5	2	II
9	Discuss the importance of measuring central tendency in data analysis.	L5	2	II
10	Explain the significance of variance and standard deviation in statistical analysis.	L5	2	II
11	Describe how quartiles and the interquartile range (IQR) are used in summarizing data distributions	L5	2	II

12	Discuss the role of graphic displays in summarizing basic statistical descriptions of data.	L5	2	II
13	Explain how to create a vector in R. Include the different ways to name vectors and perform vector arithmetic (addition, subtraction, multiplication, and division). Provide examples to illustrate how vectors can be used in data analysis.	L5	3	III
14	Discuss how to subset matrices using row and column indices, as well as how to perform matrix arithmetic. Provide examples to demonstrate matrix operations	L5	3	III
15	Discuss the difference between regular factors and ordered factors in R. Explain how to create ordered factors and the significance of comparing ordered factors.	L5	3	III
16	Explain what a data frame is in R and why it is a fundamental data structure for data analysis. Discuss how to create and manipulate data frames, including subsetting, extending, and sorting data frames.	L5	3	III

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

CMR Technical Campus

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