

TE sem V CSE (IOT) R-19 C scheme

(3 hours)

[80 marks]

NOTE:

- 1. Question No 1 is compulsory
- 2. Attempt any three questions from remaining.
- 3. Assume suitable data if necessary and state the same.

Q1 Solve all questions below. 20

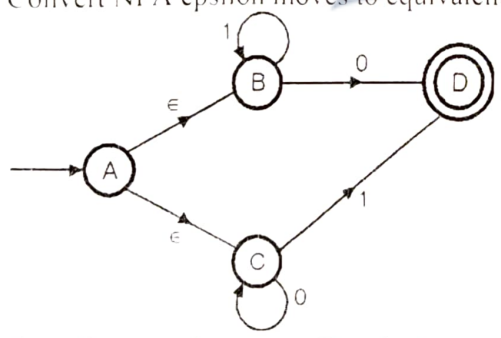
- a) Differentiate between NFA and PDA
- b) Design a DFA for accepting all strings over {0,1} divisible by 4.
- c) Design a Mealy machine to replace each occurrence of sub-string '011' by '010', where $\Sigma = \{0, 1\}$.
- d) Explain Chomsky hierarchy

Q2 10

- a) Find the grammar in Chomsky Normal form equivalent to grammar having P: $S \rightarrow aAD, A \rightarrow aB \mid bAB, B \rightarrow b, D \rightarrow d$. 10
- b) Write down Arden's Theorem. Using Arden's theorem, construct a regular expression corresponding to the state diagram shown below. 10



Q3 a) Convert NFA epsilon moves to equivalent Minimized DFA. 10



b) State Pumping lemma for Regular Languages. Let $L = \{w.w^K; w^K \text{ is reversal of } w, w \in \{0,1\}^*\}$; Show that L is not regular. 10

Q4 a) Explain the types of Turing machines in detail. 10

b) Let G be the grammar $S \rightarrow aB \mid bA, A \rightarrow a \mid aS \mid bAA, B \rightarrow b \mid bS \mid aBB$. For the string aabbabbba. Find Leftmost, Rightmost derivation and Parse tree? 10

- Q5**
- a) Construct a PDA equivalent to following CFG $P: S \rightarrow 0BB, B \rightarrow 0S \mid 1S \mid 0$. Test if 010000 is in the languages. 10
 - b) Design a Turing machine to find 2's complement of a binary number. Show simulation of device on input '1010100'. 10

Q6 Write note on (Any 04)

- a) Post Correspondence Problem 05
- b) Halting Problem. 05
- c) Acceptance by PDA 05
- d) Applications of regular expression and finite automata 05
- e) Universal Turing Machine 05
- f) Closure properties of Regular Languages. 05



TE sem II CSE (IOT) R-19 C scheme

Time: 3 hours

Max. Marks: 80

- N.B. (1) Question one is Compulsory.
 (2) Attempt any 3 questions out of the remaining.
 (3) Assume suitable data if required.**

- Q. 1 Solve any Four out of the following (5 marks each) 20M
- Explain software Re-engineering.
 - Explain the types of Black Box Testing.
 - Explain the LOC.
 - Different between Alpha and beta testing
 - Compare Waterfall Model and Spiral Model.
- Q. 2 a. Explain Prescriptive process models. 10 M
- b. Explain the Unit testing in detail. 10 M
- Q. 3 a) Explain version control and change control in SCM. 10 M
- b) Explain the FP Estimation techniques in details. 10 M
- Q. 4 a) Explain the Effective module Design. 10 M
- b) Explain Risk and its types? Explain the RMMM plan. 10 M
- Q. 5 a) Explain the general IEEE format of SRS. 10 M
- b) Explain different types of maintenance in detail. 10 M
- Q. 6 Solve any Four 20 M
- Explain CMM.
 - Different between Waterfall and Spiral Model?
 - Explain the Use Case model.
 - Explain the tracking and scheduling.
 - Explain the Types of RE.

TE Sem Vth (SEECIO) R-19 CScheme

Max Marks: 80

Duration: 3hrs

- N.B.: (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

- 1 Attempt any FOUR [20]
- What is the difference between PHP and Java Script?
 - Design a basic registration form that contains fields such as First Name, Last name, Mobile No, Email Id and address. Write java script code for validation of the same?
 - What are the characteristics of Rich Internet Application?
 - Discuss any two validation functions in Java Script?
 - What is React JS? Explain React components?
- 2 a Explain the concept of AJAX and how it differs from traditional web development approaches? [10]
- b How does PHP handle session tracking and user authentication? Provide an example of a login system using PHP and MySQL? [10]
- 3 a Develop the CSS code to apply the following styles to the paragraph below the specified heading: [10]
- Utilize a yellow text color
 - Set the font size to 25px
 - Apply a bold font style
- b Examine the concept of JSON by inspecting its structure and function, and categorize its usage with an example that demonstrates how data is represented and exchanged in web applications? [10]
- 4 a Create an HTML page that displays the message "Responsive Design in Action." Write a media query that changes the background color to light blue when the browser window is 500px wide or less, and otherwise keeps the background color as white? [10]
- b What is the purpose of using regular expressions in JavaScript? How can regular expressions be utilized to validate email addresses, and how would you incorporate JSON in the process? [10]
- 5 a Explain the differences between the HTTP GET and POST methods and evaluate their appropriate usage scenarios with practical examples? [10]
- b Write a PHP program that tests whether an email address is input correctly. Test your program with both valid and invalid email addresses? [10]
- 6 a Construct a JavaScript function that returns the Fibonacci sequence up to a given number, utilizing memorization for optimized performance? [10]
- b Describe the role of JSX (JavaScript XML) in React. How does JSX help simplify the development of the user interface for your task management application? [10]

TE Sem Vth (CSECIOT) R-19 CScheme

(3 Hours)

[80 Marks]

- Note (1). Question No.1 is compulsory.
 (2). Out of the remaining attempt any three.
 (3). Assume and mention suitable data wherever required.

Q.1 Solve any Four of the following. (5 marks each) 20

- A. What are the basic building blocks of Data Warehouse?
 B. What are the major issues in Data Mining?
 C. Differentiate supervised and unsupervised learning.
 D. Explain k-medoids algorithm.
 E. Explain Market Basket analysis with an example.
 F. Explain web-usage mining in detail.

Q.2 A) Explain different steps involved in data preprocessing. 10

- B) The college wants to record the marks for the courses completed by the students using the dimensions: a) Course, b) student, c) time and a measure aggregate marks.

Create a cube and describe following operations:

- i) Roll up, ii) Drill down, iii) Slice and iv) Dice. 10

Q.3 A) A database has five transactions. Let minimum support count = 2 and minimum confidence = 60%. Find all frequent itemsets using Apriori algorithm. Also list strong association rules. 10

T ID	Items
100	1, 3, 4
200	2, 3, 5
300	1, 2, 3, 5
400	2, 5
500	1, 3, 5

B) Explain the types of attributes and data visualization 10

- Q.4 A) Explain K-means algorithm with diagram. Use k-means algorithm to create 3-clusters for given set of values : {2, 3, 6, 8, 9, 12, 15, 18, 22} 10
- B) Explain ETL process in detail. 10
- Q.5 A) What is web structure mining? Describe page ranking technique with the help of example. 10
- B) Demonstrate Multidimensional and Multilevel Association Rule Mining with suitable example. 10
- Q.6 A) What is classification? Explain any one classification algorithm with example. 10
- B) Write short on the following. (5 marks each) 10
- i) FP Tree
 - ii) Fact Constellation Schema



TE sem Vth C&ECIT R-19 C scheme

Time: 3 hours

Max. Marks: 80

N.B. (1) Question one is Compulsory.**(2) Attempt any 3 questions out of the remaining.****(3) Assume suitable data if required.**

- Q. 1 Solve any Four out of the following (5 marks each) 20M
- Compare FTR and Walkthrough
 - Explain the Requirements model.
 - Explain the LOC.
 - Different between Alpha and beta testing
 - Compare Scrum and Kanban
- Q.2 a) Explain Risk and its types? Explain the RMMM plan. 10 M
- b) Explain the different techniques in white box testing. 10 M
- Q. 3 a) Explain steps in version and change control. 10M
- b) Explain the FP Estimation techniques in details. 10M
- Q. 4 a) Explain cohesion and Coupling. Explain different types with detailed example. 10M
- b) Explain the Spiral model of software development 10 M
- Q. 5 a) Explain the general format of SRS for Hospital Management system 10M
- b) Explain software Re-engineering in detail. 10M
- Q. 6 Solve any Four 20M
- Explain the CMM model.
 - What are the different types of maintenance?
 - Explain the Scenario based model.
 - Explain the tracking and scheduling.
 - Discuss the different level of DFD

TE from Vth CSE(CIT) R-19 eScheme

[Time: 3 Hours]

[Marks:80]

N.B

- (1) Question no. 1 is compulsory.
- (2) Attempt any 3 from the remaining questions.
- (3) Assume suitable data if necessary.
- (4) Figures to right indicate full marks.

- Q.1 **Attempt any four of the following**
- a) What are frames? Explain any 2 framing methods in detail. 5
 - b) Explain TCP Timers. 5
 - c) Explain the need of DNS? What are DNS name spaces? 5
 - d) Compare the OSI & TCP/IP reference models. 5
 - e) What is the use of checksum? Explain the CRC steps to calculate the checksum. 5
 - f) Compare Subnet and Supernet? A network on the Internet has a subnet mask of 255.255.192.0. What is the maximum number of hosts it can handle? 5
- Q.2 **Attempt the following**
- a) Compare and contrast coaxial cable & fiber optics cable? A 2 km long broadcast LAN uses CSMA has 10^9 bps bandwidth and uses CSMA/CD. The signal travels along the wire at 400000 km/s. What is the minimum packet size that can be used on this network? 10
 - b) Explain the open loop congestion control and closed loop congestion control policies in detail. 10
- Q.3 **Attempt the following**
- a) An ISP is granted a block of addresses starting with 190.100.0.0/16 (65,536 addresses). The ISP needs to distribute these addresses to three groups of customers as follows: 10
 - a. The first group has 64 customers: each need 256 addresses.
 - b. The second group has 128 customers: each need 128 addresses.
 - c. The third group has 128 customers: each need 64 addresses.
 Design the subblocks and find out how many addresses are still available after these allocations
 - b) Explain the TCP connection establishment and Connection release. 10
- Q.4 **Attempt the following**
- a) Compare and Contrast TCP and UDP protocol? Explain the header format used at the transport layer by TCP protocol. 10
 - b) Enlist and elaborate the issues in designing the layered protocol architecture 10
- Q.5 **Attempt the following**
- a) Explain the concept of sliding protocol? Explain the selective repeat protocol with example? Compare the performance of Selective repeat & Go-back-N protocol. 10
 - b) Explain Distance vector routing? Also elaborate the count to infinity problem and its solution. 10
- Q.6 **Write a short note on**
- a. ARP & RARP 10
 - b. DNS 10

T.E. Vth Sem (R-19-20 CScheme) CSECI07

(3 hours)

[80 marks]

NOTE:

1. Question No 1 is compulsory
2. Attempt any three questions from remaining.
3. Assume suitable data if necessary and state the same.

Q1. [20]

- a) Show that grammar represented by production rules given below is ambiguous.
 $S \rightarrow S + S \mid S - S \mid S * S \mid S/S \mid (S) \mid a$
- b) Construct a Moore machine to output remainder modulo 4 for any binary number.
- c) Differentiate between NPDA and PDA.
- d) Explain Chomsky Hierarchy.

Q2.

- a) Write steps for converting CFG to CNF form. Convert the following CFG to CNF. [10]
 $S \rightarrow ASB \mid c \quad A \rightarrow aAS \mid a \quad B \rightarrow SbS \mid A \mid bb$
- b) Convert following RE to NFA-c and convert it to minimised DFA corresponding to it
 $(0+11)^*(10)(11+0)^*$ [10]

Q3.

- a) Construct a PDA for accepting $L = \{a^n b^m c^n \mid m, n \geq 1\}$ [10]
- b) Give formal Definition of Pumping Lemma for Regular Language. Prove that the following language is not regular. $L = \{wrw^r \mid w \in \{a,b\}^*, r \in \{c\}, |w| \geq 1\}$ [10]

Q4.

- a) Construct CFG for following
- i. Alternate sequence of 0 and 1 starting with 0 [03]
 - ii. Do not contain 3 consecutive a over {a,b} [04]
 - iii. $L = \{x \in \{0,1\}^* \mid x \text{ has equal number of 0's and 1's}\}$ [03]
- b) Explain applications for FA, PDA and TM [10]

Q5.

- a) Construct a Moore machine to convert all occurrences of 100 to 101 in a string over $\{0,1\}^*$. convert it to equivalent Mealy Machine [10]
- b) Design a TM accepting all palindromes over $\{0,1\}$ [10]

Q6. Write short note (Solve Any 4) [20]

- a) Decision Properties of Regular Languages
- b) Post Correspondence Problem
- c) Variants of Turing Machine
- d) Acceptance by a PDA
- e) Conversion of Moore to Mealy Machines

Duration: 3hrs

Max Marks: 80

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 (4) Assume suitable data, if required and state it clearly.

- | | | |
|---|--|------|
| 1 | Attempt any FOUR | [20] |
| a | Explain the use of checksum in TCP segment and How it is calculated? | 5 |
| b | Describe connection oriented and connectionless services. | 5 |
| c | Generate CRC for message 101111 where binary divisor is 1011 | 5 |
| d | Discuss ARP and explain its use in computer network communication. | 5 |
| e | What is three ways handshaking technique used in transport layer? | 5 |
| 2 | a How virtual communication is carried out in ISO-OSI reference model? | [10] |
| | b Why framing is used at DLL? Also explain its different types. | [10] |
| 3 | a Discuss format structure for TCP segment. | [10] |
| | b What are the different types of socket and how it is useful for client server communication? | [10] |
| 4 | a What is dynamic routing? Which algorithms are used for it? | [10] |
| | b What is congestion? Discuss different techniques to prevent and control congestion. | [10] |
| 5 | a Explain different types of cables used in Guided transmission media. | [10] |
| | b How CSMA/CD protocol is useful to control collision in computer network? | [10] |
| 6 | a How DNS is useful for web browsing? Explain name resolution process? | [10] |
| | b How selective repeat ARQ protocol helps to control flow in computer network | [10] |

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Max Marks: 80

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 (4) Assume suitable data, if required and state it clearly.

- 1 Attempt any FOUR [20]
- Explain the differences between client-side scripting and server-side scripting, and provide examples of each?
 - Create an HTML form for user feedback including Name, Email, Rating (1-5), and Comments. Write JavaScript code to validate all fields.?
 - Explain the concept of AJAX and how it differs from traditional web development approaches?
 - Design a simple calculator using PHP?
 - How can you fetch JSON data from an API using JavaScript?
- 2 a Describe the structure of both HTTP Request and HTTP Response messages and explain how a client communicates with a web server using HTTP? [10]
- b Write a JavaScript program that validates a registration form using regular expressions (e.g., email, phone number, and password). Explain the concept of exception handling in your solution.? [10]
- 3 a Explain the Servlet Life Cycle with a neat diagram. How do GET and POST methods differ in handling form data? Write a simple example? [10]
- b Discuss how AJAX improves the user interface of a web application. Write a program using the jQuery framework with AJAX to fetch data from the server and display it dynamically.?[10]
- 4 a Write a PHP program to connect with a MySQL database and insert user registration details (Name, Email, Password). Explain how user tracking can be implemented in PHP applications? [10]
- b Explain the features of React.js. Write and explain the steps to create a simple "Hello World" React application? [10]
- 5 a Explain the JavaScript DOM Model with a neat diagram. Discuss how DOM is used for accessing and modifying HTML elements dynamically with suitable code examples? [10]
- b Explain with an example how a Servlet connects to a database using JDBC. Also describe how session handling and cookies help to maintain user state in web applications? [10]
- 6 a Using the fundamental syntax and semantics of HTML5, create a simple webpage that includes a table with at least three rows and two columns, a list, and an embedded image? [10]
- b Explain XML Schema and Document Object Model (DOM) in detail. Differentiate between DOM and SAX parsers with suitable examples? [10]
