

## 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.

[20]

- a) Difference between NFA & DFA
- b) Design a Moore machine for binary adder. Clearly list all components that make up the machine.
- c) Construct the right linear grammar corresponding to regular expression  $R = (0+1)1^*(1+(01)^*)$
- d) Explain Pumping Lemma for CFG.

Q2.

[10]

- a) Construct PDA accepting the language  $L = \{a^{2n}b^n \mid n \geq 0\}$
- b) Consider the following grammar:  $S \rightarrow ICtS \mid ICtSeS \mid a, C \rightarrow b$

[10]

For the string 'ibtibtaea' find the following:

- i) Is this a CFG? Explain your answer.
- ii) Leftmost derivation
- iii) Rightmost derivation
- iv) Parse tree for both of above
- v) Check if the above grammar is ambiguous.

Q3.

- a) Construct a DFA accepting a language generated by the left linear grammar given below

$$S \rightarrow Ca \mid Bb, C \rightarrow Bb, B \rightarrow Ba \mid b$$

[10]

- b) Construct the finite automata equivalent to the following regular sets

$$i) 10+(0+11)0^*1$$

$$ii) 01[(10)^*+111)^*+0]^*1$$

[10]

Q4.

- a) Design a TM to add two unary numbers

[10]

- b) Design a finite automata with output to check divisibility by 3 to binary number.

[10]

Q5.

- a) Write a short note on Pumping Lemma for regular language. Prove  $L = \{a^{2n}b^{3n} \mid n > 0\}$

is not a regular language using pumping lemma.

[10]

- b) Construct PDA accepting the language  $L = \{a^{2n}b^n \mid n > 0\}$

[10]

Q6.

- a) Explain Chomsky hierarchy

[10]

- b) Write a detail note on halting problem

[10]



TE sem V<sup>th</sup> C&E (IT) 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 V<sup>th</sup> CSECIOT) R-19 CScheme

[Marks:80]

[Time: 3 Hours]

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** 5
- 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** 10
- 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** 10
- 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** 10
- 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** 10
- 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** 10
- a. ARP & RARP 10
  - b. DNS 10

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TE Sem V<sup>th</sup> CSE(CIT) 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



TE Sem V<sup>th</sup> (SEEC107) R-19 CScheme

Duration: 3hrs

Max Marks: 80

- 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]

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