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B.TECH (CSE) – Vth Semester

Mid Exam- CSL-330: System Analysis & Design

Time: 1Hr

Max Marks: 20

Note: Attempt all questions. All questions carry equal marks.

1. Differentiate between various fact gathering techniques with the help of real life project? (5)
2. Compare and Contrast between different roles played by system analyst? (5)
3. What is feasibility report? Write its importance? (5)
4. Explain the following:
 - a) Software Design in SDLC (2.5)
 - b) MIS Planning (2.5)

Department of Computer Engineering and Technology
Mid-Term Exam
B.Tech. CSE/CE 5th Sem
Programming in ASP.NET (CSL-336)

Time Allotted: 1 Hour

Note: All the questions are compulsory.

Max. Marks: 20

1. What is the full form of CLR? Explain briefly the concept of CLR.
2. With the help of an example, explain the concept of Method.
3. What do you mean by Browser Link?
4. With the help of an example, explain any five HTML Tags.

(5)

(5)

(5)

(5)

B.Tech. (Computer Science Engineering) – 5th Semester

CSL-332: Relational Database Management System

Time allowed – 1 hour

Maximum Marks-20

Note: Attempt all questions. Each carry equal marks.

1. What is a database? Explain the advantages and limitations of Database Management System over File Processing System.
2. What is data independence in DBMS? Explain its types with examples.
3. What is a foreign key? Explain the concept of Referential Integrity Constraint with the help of an example.
4. What is DML? How it is different from DDL? Illustrate the difference through suitable examples.

Mid Term Exam

B.Tech Sem-V

CSL-336:- Programming in ASP.NET

Time Allowed:- 1 hr

Max.Marks:20

Note: - All Questions are compulsory and carries equal marks.

1. Discuss the components of ASP.NET page with the help of program in detail.
2. (a) Define event. Explain different page events in detail.
(b) Explain the lifecycle of ASP.NET page.
3. Explain various HTML Server Controls with the help of program.
4. Write short notes on the following:-
 - (a) Subroutines and Functions
 - (b) Code-behind Files

Mid Term Exam

Guru Nanak Dev University, Amritsar

Introduction to Industry 4.0 and Industrial Internet of Things

Max Marks: 20

Time allowed: 1 Hour

- Q.1. What do you mean by IoT ?
- Q.2. What is the role of sensing and actuators in IoT ?
- Q.3. Explain the concept of IoT by showing a block diagram of the network.
- Q.4. Explain any 2 potential applications of IoT in detail.

(5x4=20)

Formal Languages & Automata Theory
CSL-351

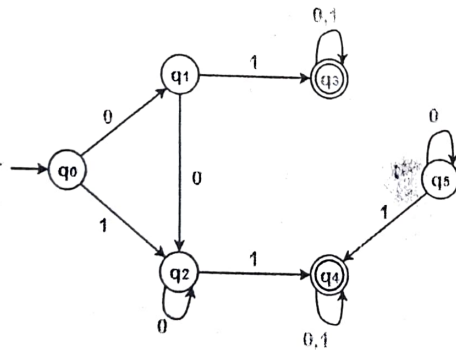
Time: 1 hour

Max. Marks 20

Note: Attempt all questions.

Q1) For the alphabet $\Sigma = \{a,b\}$, give regular expression for the language of all strings containing AT LEAST two a's. Convert the given regular expression into its equivalent DFA. 8 Marks

Q2) Minimize the given DFA



7 Marks

Q3) Define grammar. Explain Chomsky Hierarchy with an example.

5 Marks

Guru Nanak Dev University, Amritsar
Mid Semester Examination
B.Tech (CSE) 5th Semester
CSL-333 (Design and Analysis of Algorithm)

Time Allotted: 1 Hours

Max Marks: 20

Note: All questions are compulsory.

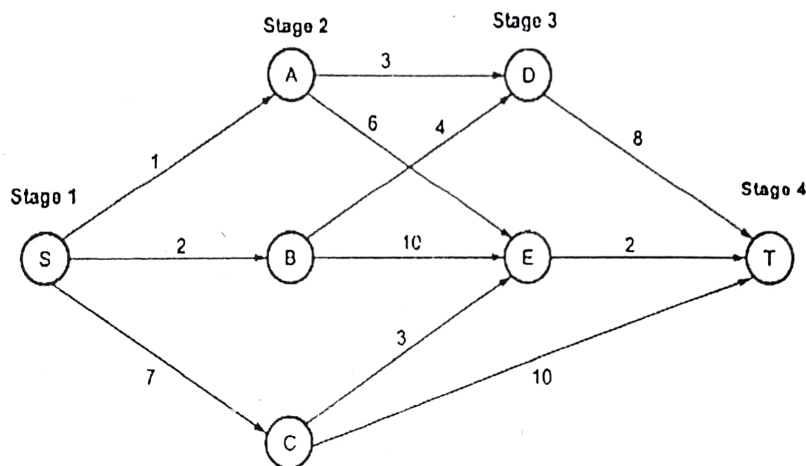
Q1: Define the term algorithm. What are the various properties associated with it? (3)

Q2: What do you mean by the term time and space complexities? (2)

Q3: Solve the following knapsack problem having capacity **W=60** using fractional method: (5)

Item	Weight	Value
I ₁	5	30
I ₂	10	20
I ₃	20	100
I ₄	30	90
I ₅	40	160

Q4: Give step by step solution of following multistage graph using dynamic programming? (5)



Q5: Find Maximum and Minimum for the following list using divide & conquer: (5)

22	13	-5	-8	15	60	17	31	47
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B.Tech. Computer Science and Engineering (CSE) - 5th Sem.
(Credit Based Evaluation and Grading System) (Batch 2020-24)
(2222)

Paper : CSL-351 Formal Languages & Automata Theory

Time Allowed: 3hrs.

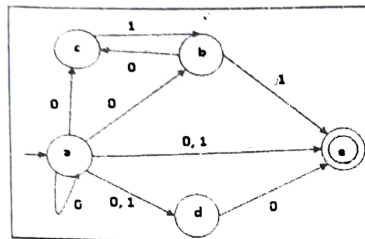
Max. Marks: 80

Instructions:

- It is compulsory to attempt at least 1 question from each section.
- Attempt any 5 out of 8 questions.

Section A

1. A) What are transition systems? With an appropriate example explain what differentiates NDFA from DFA. Create an equivalent DFA for the following NDFA.



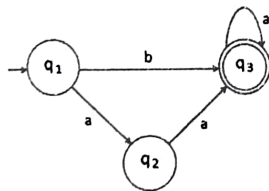
[10]

- B) Design a Finite Automata over alphabet $\Sigma = \{0,1\}$, which accepts the set of strings either start with 01 or end with 01.

[6]

2. A) State the formal recursive definition of regular expressions. Construct a finite automaton for the following regular expression: $(0+1)^*(00+11)(0+1)^*$. [10]

- B) For the finite automata in the following figure find the corresponding regular expression.



[6]

Section B

3. A) State and prove closure properties of Context-Free Languages. [6]

- B) Design a PDA for the following CFG,

$G = (V_n, V_t, P, S)$ with $V_n = \{S\}$, $V_t = \{(,)\}$ and P is defined as follows:

$S \rightarrow \epsilon, S \rightarrow SS, S \rightarrow (S).$

[10]

4. A) Explain the role of derivation trees in identifying the ambiguity in grammar.

[6]

- B) Convert the grammar $S \rightarrow AB, A \rightarrow BS \mid a, B \rightarrow SA \mid b$ into GNF. [10]

(2)

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Section C

5. A) Differentiate between LL(K) Grammar and LR(K) Grammar. Define Kuroda Normal Form (KNF). Stress upon the points that differentiate KNF from CNF.

[8]

B) Simplify the following grammar G,

$S \rightarrow aAD, A \rightarrow aB \mid bAB, B \rightarrow C, D \rightarrow F, C \rightarrow E, E \rightarrow b, F \rightarrow d, A \rightarrow \lambda.$

[8]

6. Write a short note on the Chomsky Classification of Languages. Elaborate on the methods to describe Turing machines (TM). Design a TM that accepts $\{0^n 1^n \mid n \geq 1\}$.

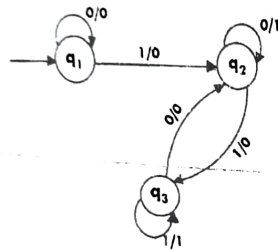
[16]

Section D

7. A) From the perspective of Formal Languages and Automata Theory explain the relevance of rewrite systems. With help of appropriate examples put light on the Canonical Derivations, Context Sensitivity, and Algebraic Languages.

[10]

B) Convert the following Mealy machine into equivalent Moore machine.



[6]

8. Define Cellular Automaton. What is the importance of a Two-Dimensional Cellular Automaton?

Write short notes on the following:

- Universality and Complexity in Cellular Automaton
- Algebraic Properties of Cellular Automaton

[16]

B.Tech. Computer Science and Engineering (CSE) - 5th Sem.
(Credit Based Evaluation and Grading System) (Batch 2020-24)
(2222)

Paper : CSL-330 : System Analysis and Design

Time Allowed: 3hrs.

Max. Marks: 80

Attempt **Five** questions out of **Eight**. Attempt any one from each section and fifth from any section. All questions carry equal marks.

Section A

- I. a) How the different kinds of information systems at the various organization levels support different types of decisions in MIS? Explain in detail. (8)
- b) What are the stages of Decision Making? How Intelligence is different from Decision Making process? (8)
- II. Write short notes on following:
 - a) Prototyping (8)
 - b) Role of System Analyst (8)

Section B

- III. Explain the procedure for Cost Benefit Analysis (CBA)? Discuss all the methods used for the evaluation of CBA? (16)
- IV. Explain the importance of system planning and initial investigation? What are the strategies for determining information requirements? (16)

Section C

- V. How structural design methodology is used in function-oriented design? Explain different steps used in design methodology with a suitable example? Illustrate with the help of real life example the use of different tools of structured design? (16)
- VI. Explain the activity network for System Testing? Discuss the Quality Assurance in detail? (16)

Section D

- VII. Explain the process of Audit Trails and Risk Management in detail with examples? (16)
- VIII. Write a case study on Library Management System (LMS) following all aspects of SDLC? Draw DFD Level 1 and Level 2 for LMS using conventions and explain pros and cons of the existing system from the traditional system using possible assumptions? (16)

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B.Tech. Computer Science and Engineering (CSE) - 5th Sem.
(Credit Based Evaluation and Grading System) (Batch 2020-24)
(2222)

Paper : CSL-333 : Design and Analysis of Algorithm

Time Allowed: 3hrs.

Max. Marks: 80

Note: Attempt five questions, selecting at least one question from each Section and the fifth question may be attempted from any Section.

SECTION-A

Q1: (a) Write a note on Asymptotic Notations. (10)

(b) How combine part affects the complexity in divide and conquer? (6)

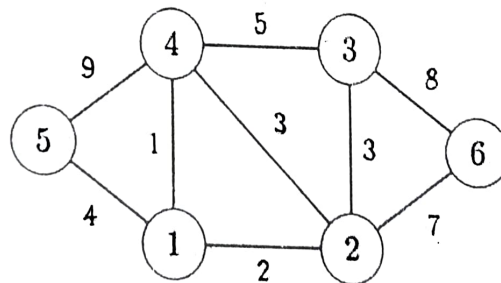
Q2: (a) Discuss the critical role played by the selection of pivot element in complexity of quick sort. (8)

(b) From the given list of elements, find $X=23$ using the concept of binary search: (8)

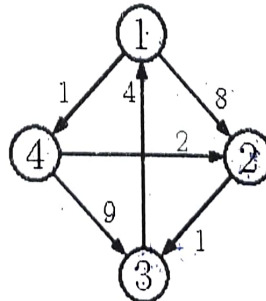
10	25	4	20	8	15	23	5	40
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SECTION-B

Q3: Solve the following MST using prim's and kruskal. Also write their algorithms: (16)



Q4: (a) Find the all pair shortest path using dynamic programming: (8)



(b) Differentiate between divide & conquer and dynamic programming approach. (4)

(c) Explain the working principal of dynamic programming approach. (4)

(2)

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SECTION-C

- Q5:** (a) Explain the concept of graph coloring with the help of suitable example. Also, write an algorithm for the same. (8)
- (b) Given a set S (2, 3, 5, 7), and $X=10$. Find subset-sum using backtracking approach. (8)
- Q6:** Write an algorithm for N-Queen problem? Solve 4-Queen problem using backtracking. (16)

SECTION-D

- Q7:** (a) What are the computational limitations of an algorithm? (8)
- (b) State and prove cook's theorem. (8)
- Q8:** (a) Explain the concept of P and NP classes in detail. (8)
- (b) Differentiate between the following: (8)
- i) Deterministic & Non-Deterministic algorithms
 - ii) Closed Gap & Algorithmic Gap Problems

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Sr.No.9505

B.Tech. (Computer Science & Engg.) - 5th Semester (CBEGS)

(Batch 2020-24)

(2222)

Paper : CSL-332 : Relational Database Management System

Time allowed: 3 hrs.

Max. Marks: 80

Note: Attempt five questions, selecting at least one question from each Section and the fifth question may be attempted from any Section.

Section A

1. (a) Elaborate on Three Level ANSI-SPARC Architecture. (6)
(b) What do you understand by the term data model? With the help of suitable examples categorize and explain these data models. (10)
2. (a) "The relational algebra is a theoretical language with operations that work on one or more relations to define another relation without changing the original relation(s)". Discuss the aforementioned sentence in detail with suitable examples. (8)
(b) What are Relational Keys? Explain the relevance of Integrity Constraints in DBMS. (8)

Section B

3. (a) Differentiate between DDL, DML, and DCL. (8)
b. Explain the purposes of Views. Also, explain why Views are termed virtual. (8)
4. (a) Define Normalization. Explain the process and the need to perform Normalization. (8)
b. Normalize the following table to the third normal form. (8)

Student#	Advisor	Adv-Room	Class	Class	Class
1022	Jones	412	101-07	143-01	159-02
4123	Smith	216	101-07	143-01	179-04

Section C

5. (a) Compare SQL, PL-SQL, and NoSQL. (8)
(b) Write SQL queries to create, alter and delete a table named Student. (8)
6. (a) Write a short note on the following: (10)
(i) Query Optimization
(ii) Query Decomposition
(b) Explain how Relational Algebra Operations can be used for Query Optimization. (6)

Section D

7. (a) How is Database Recovery crucial to Database Management System? (6)
(b) State the reasons why Database Security is considered important. Explain the threats and countermeasures to justify your answer. (10)
8. (a) With the help of a state transition diagram explain the procedure of performing a transaction. (5)
(b) What is the need to perform Concurrency Control? (5)
(c) Elaborate on the term Serializability. (6)

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Sr.No.9506

**B.Tech. Computer Science & Engineering (CSE) - 5th Semester
(CBEES) (Batch 2020-24)
(2222)**

Paper : CSL-336 Programming in ASP.Net

Time allowed: 3 hrs.

Max. Marks: 80

Note : Student has to attempt total five questions. One question from each section. Fifth question may be attempted from any section.

Section-A

1. What do you understand by .NET Framework? Explain its components in detail. (16)
2. Write a short note on:-
 - a) Operator and its types (8)
 - b) Inheritance in C# (8)

Section-B

3. Write a short notes on:-
 - a) Cascading Style Sheets (CSS) (8)
 - b) Web Form (8)
4. Describe the HTML and List Controls in details. (16)

Section-C

5. What do you understand by validation control in ASP.NET? What are various types of validators? (16)
6. How do we connect the .NET Framework with SQL Server database? Explain it with steps in detail. (16)

Section-D

7. Explain the concept of Authentication and Authorization with its types in detail. (16)
8. Explain the concept of sending Email in ASP.NET in detail with the help of example. (16)

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Guru Nanak Dev University, Amritsar

B.Tech CSE / CE, 5th Sem

Subject: Introduction to Industry 4.0 & Industrial Internet of Things

Paper: ECM - 103

Max Marks: 80

Time: 3 Hours

Note: The Candidates are required to attempt five questions by selecting one question from each section and the fifth question can be attempted from any section. All questions carry equal marks.

Section -A

- 1 (a). What is the role of sensors and actuators in IoT? Classify Sensors and actuators. (8)
- 1 (b). What is the fourth industrial revolution? What are physical megatrends of industry 4.0? (8)
- 2 (a). What is a smart factory? What are the needs and advantages of a smart factory? (8)
- 2 (b). Explain the Role of AI in industry 4.0, what are advantages and challenges to AI in IIoT? (8)

Section-B

- 3 (a). What do you mean by cyber security? Write a note on elements of cybersecurity. (8)
- 3 (b). What is the difference between IIoT and Automation? (8)
- 4. What is a business model? What are its building blocks and what is the need of business models for IoT? (16)

Section-C

- 5. Explain IIoT analytics in detail, also explain its types and challenges? (16)
- 6 (a). What are the types of machine learning algorithms? Write any one application of machine learning in IIoT. (8)
- 6 (b). What is the need of the cloud in IIoT? Explain software as a service (SaaS) and Infrastructure as a Service IaaS. (8)

Section-D

- 7 (a). Explain why security is required in IIoT, what are basic security goals? (8)
- 7 (b). Explain various benefits of IIoT in the healthcare industry with suitable examples. (8)
- 8 (a). Differentiate traditional and smart manufacturing. What are the features of a smart factory? (8)
- 8 (b). Explain IIoT applications for the food industry in detail. (8)