



# DADI INSTITUTE OF ENGINEERING & TECHNOLOGY

(Approved by A.I.C.T.E., New Delhi & Affiliated to JNTUK, Kakinada)

NAAC Accredited Institute

An ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007 Certified Institute.

NH-5, Anakapalle – 531002, Visakhapatnam, A.P.

Phone: 08924-221111 / 221122/9963981111, www.diet.edu.in, E-mail: [info@diet.edu.in](mailto:info@diet.edu.in)

## Question Bank

SUBJECT: COMPILER DESIGN

CLASS: III-I

ACADEMIC YEAR: 2018-19

### UNIT WISE IMPORTANT QUESTIONS

#### UNIT-1

- Discuss in brief about the Role of Lexical analyser in a compiler. [4 Marks]
  - Explain in brief about Lexical errors and Reserved words and identifiers [6 Marks]
- What are the different phases of compiler in synthesizing the target program? [5 Marks]  
Explain with an example.
  - How to recognize various tokens of high level language program? Write the regular expressions and transition diagrams for each. [5 Marks]
- What is the relationship with lexical analyzer, regular expressions and transition diagram? Give an example. [5 Marks]
  - Explain different modules used for language processing. [5 Marks]
- Explain the role of lexical analysis buffering [5 Marks]
  - Explain the way in which high level languages are processed by interpreter and compiler

#### UNIT-2

- Prove that the given grammar is ambiguous and eliminate ambiguity in it.  
 $G: S \rightarrow iEtSeS|iEtS|a, E \rightarrow b|c|d$  [5 Marks]
  - With neat sketch explain the structure of non-recursive predictive parser. How to handle errors in it. [5 Marks]
- What are the preprocessing steps required for predictive parse table construction? Consider the grammar  
 $S \rightarrow ACB|CbB|Ba, A \rightarrow da|BC, B \rightarrow g|\epsilon, C \rightarrow h|\epsilon$  [6 Marks]
  - Construct the predictive parse table for the above grammar. And also check for the validity of the input string of your choice. [4 Marks]
- Construct the recursive descent parser for  
 $G: bexpr \rightarrow bexpr \text{ or } bterm|bterm, bterm \rightarrow bterm \text{ and } bfactor|bfactor, bfactor \rightarrow \text{not } factor|(bexpr)|true|false$ . What are the limitations of it? [5 Marks]
  - Construct Right most derivation for the grammar  $E \rightarrow E+T/T, \rightarrow T^*F/F, \rightarrow (E)/id$  for  $w = id+id*id$  [5 Marks]
- How to prove a grammar  $G: bexpr \rightarrow bexpr \text{ or } bterm|bterm, bterm \rightarrow bterm \text{ and } bfactor|bfactor, bfactor \rightarrow \text{not } factor|(bexpr)|true|false$  is LL(1)? [6 Marks]

- b. Construct the LL(1) parse table for the above grammar Grammar [4 Marks]

### UNIT-3

- 1.a) Explain the structure of LR parsers. How they are different from LL parsers? [4 Marks]

- b) Build LR(0) parser and check the validity of the input string “ $id+id*id$ ” by the LR(0) parser for the given grammar  $E \rightarrow E+T/T, T \rightarrow T*F/F, F \rightarrow (E)/id$  [6 Marks]

2. What is the importance of look ahead symbol in LR(1) parser? Construct the canonical LR parser for  $G: S \rightarrow L=R/R, L \rightarrow *R/id, R \rightarrow L$  [10 Marks]

- 3.a. Explain the rules to check the acceptance of input string :  $*id=*id$  [5 Marks]

- b. List out and explain the rules to construct simple precedence relation for a context free grammar. [6 Marks]

4. Explain the following:

- a) Usage of precedence and association rules to handle shift reduce conflicts in LR parsers. [5 Marks]  
 b) Error recovery LR parsers [5 Marks]

### UNIT-4

1. a) Explain the type system in type checker? Write the syntax directed definition for type checker. [5 Marks]

- b) What is syntax directed translation? Write the semantic rules for  $D \rightarrow TL, T \rightarrow int/real, L \rightarrow L, id/id$  [5 Marks]

2. a) What is an Abstract syntax tree? How to construct it using  $mknnode(), mkleaf()$  functions? Give an example. [5 Marks]

- b) What is type expression? How to construct them using various type constructors? Explain. [5 Marks]

Marks]

3. a) Differentiate bottom up and top down evaluation of semantic rules for arithmetic expressions. [4 Marks]

Marks]

- b) If  $(a < b + c * 20)$   
 {  
      $a = a * b - 50$   
      $d = (a/b) + 25;$   
     print ( a,d )  
 }

- For the given code generate three-address code. [6 Marks]

4. a) What is syntax directed translation? How it is different from translation schemes? Explain with an example. [5 Marks]

- b) Translate the given expression into Quadruples, triples and indirect triples  $(a+b)*(c+d)+(a*b/c)*b+60$ . And list advantages and disadvantages. [5 Marks]

### Unit-5

1. a) What is runtime stack? Explain storage allocation strategies used for recursive procedure calls. [5 Marks]

- b) Can we reuse the symbol table space? Explain through an example. [5 Marks]

2. a) Define Symbol table. Explain about the data structures for Symbol table. [5 Marks]  
 b) Explain about Heap Management code generation? [5 Marks]
3. a) What is scope of variable? Write about various ways to access non local variables. [5 Marks]  
 b) Generate target code from sequence of three address statements using simple code generator algorithm. [5 Marks]
4. a) Define Symbol table. Explain about the data structures for Symbol table. [5 Marks]  
 b) Explain reducible and non reducible flow graphs with examples. [5 Marks]

### **Unit-6**

1. Explain the following : [5+5 Marks]  
 a) Loop Optimization.  
 b) Peephole optimization techniques.
2. a) Differentiate various techniques used for machine independent and dependent optimizations. [5 Marks]
- b) Explain how code motion and frequency reduction used for loop optimizations? [5 Marks]
3. a). Explain in detail about dataflow analysis? [5 Marks]  
 b) How to schedule the instructions to produce optimized code? Explain. [5 Marks]
4. a) Write the algorithm to generate basic blocks and flow graph for quick sort algorithm. [5 Marks]  
 b) Apply the code optimization techniques on flow graph generated for quick sort. [5 Marks]



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## III B.TECH - I SEM Question Bank

Subject Name: DBMS

Branch: CSE

Faculty: Ramaraju

### UNIT-1

- |  |           |
|--|-----------|
| 1) a) What is a database system.   | -4Marks   |
| b) What is a Database and Why Database   | -6 Marks  |
| 2) a) Write about the data independence and its types                            | -6 Marks  |
| b) Specify what are the relational systems & other systems                       | -4 Marks  |
| 3) a) Write in details about the dbms architecture                               | -6 Marks  |
| b) Briefly describe roles of Database administrator role in database systems.    | -4 Marks  |
| 4) a) Compare the database system with conventional file system.                 | -5 Marks  |
| b) Describe in detail about two-tier and three-tier client-server architectures. | - 5 Marks |
| 5) a) Explain about database applications.                                       | -4 Marks  |
| b) Describe about Centralized and Client server architecture for the database.   | - 6 Marks |

### UNIT-II

#### Unit-II

- |   |     |
|---|-----|
| 1. a. Write about Database Design Process   | 4-M |
| b. write about the Entities, Attributes, Entity Sets, Relationships, Relationship Sets.     | 6-M |
| 2. a. Explain the Key Constraints and Class Hierarchies of E/R Model with diagrams.         | 5-M |
| b. What are Participation Constraints, Weak Entities, Aggregation with neat diagrams        | 5-M |
| 3. a. Write about the Entity versus Attributes and Entity versus Relationship               | 4-M |
| b. Write about the Binary Vs Ternary Relationships and Aggregation vs Ternary Relationships | 6-M |
| 4. a. Explain about Key Constraints, Foreign Key Constraints, General Constraints           | 5-M |
| b. Write in detail about various types of joins with examples                               | 5-M |
| 5. a. Write about the Projection and Selection in Relation Algebra.                         | 4-M |
| b. Write about the various set Operations with examples                                     | 6-M |
| 6. a. Write in detail about the Tuple Relation Calculus with syntax & examples              | 5-M |
| b. Write in detail about the Domain Relation Calculus with syntax & examples                | 5-M |

### UNIT-III

#### Unit-III

- |  |     |
|--|-----|
| 1. a. Write about the Select Syntax completely in detail with example                              | 4-M |
| b. Write SQL Queries for the following question  | 6-M |
| I. Find the sids of sailors who have reserved a red boat.  |     |
| ii. find the names of the sailors who have reserved at least one boat.                             |     |
| iii. find the ages of sailors whose name begins and ends with B and has at least three characters. |     |
| 2. a. Write about the Union , Intersect and except with syntax in sql.                             | 6-M |
| b. Write SQL Queries for the following :   | 4-M |
| i. Find all sids of sailors who have a rating of 10 or reserved boat 104.                          |     |
| ii. Find the sids of all sailors who have reserved red boats but not green boats.                  |     |
| 3. a. What are the differences between nested queries and correlated nested queries                | 5-M |
| b. Write about the Null Values and Logical Connectives AND , OR and NOT.                           | 5-M |
| 4. a. Write about various aggregate function and set comparison operators in SQL                   | 6-M |
| b. Write in detail about Group-By and Having Clauses   | 4-M |
| 5. a. Write about few complex integrity constraints in SQL   | 5-M |
| b. What is Trigger and what are the differences between Constraints and Triggers.                  | 5-M |

## UNIT-IV

- 1) a) Explain insertion, deletion and modification anomalies with suitable examples. -5 Marks  
b) State BCNF. How does it differ from 3NF? -5 Marks
- 2) a) What is meant by the closure of functional dependencies? Illustrate with an example. -5 Marks  
b) State 1NF, 2NF & 3NF and explain with examples. -5 Marks
- 3) a) State the Armstrong inference rules. Provide suitable examples to describe each. -5 Marks  
b) Show how to preserve Functional Dependencies during decomposition. -5 Marks
- 4) a) What is normalization? Explain its need. -4 Marks  
b) Discuss in detail about various normal forms. -6 Marks
- 5) a) What is lossless join? Briefly describe problems caused by redundancy. -5 Marks  
b) What is BCNF? What is the motivation for putting a relation in BCNF? What is the motivation for 3NF? In what way 3NF is different from BCNF. -5 Marks

## UNIT-V

- 1) a) Draw transaction state diagram and describe each state that a transaction goes through during its execution. -5 Marks  
b) Explain in detail about timestamp based concurrency control techniques. -5 Marks
- 2) a) Discuss about different types of failures. -4 Marks  
b) What is 2-phase locking protocol? How does it guarantee serializability? -6 Marks
- 3) a) Why the concurrency control is needed? Explain it. -4 Marks  
b) Write and explain optimistic concurrency control algorithm. -6 Marks
- 4) a) Write short notes on:  
i) Phantom Record ii) Repeatable Read iii) Incorrect Summary iv) Dirty Read. - 6Marks  
b) Describe Wait/Die and Wound/Wait deadlock protocols. -4 Marks
- 5) a) List the ACID properties. Explain the importance of each. -5 Marks  
b) What is serializability? With an example briefly describe conflict serializability. -5 Marks

## UNIT-VI

- 1) a) Explain in detail about Data on External Storage- File Organization and Indexing. -6 Marks  
b) Discuss about cluster and Multilevel indexes. -4 Marks
- 2) a) Explain in detail about Clustered Indexing. -6 Marks  
b) By considering an example, show how to reduce access time with primary index and secondary index. -4 Marks
- 3) a) Explain in detail about the Index Data Structures. 5Marks  
b) Describe different methods of defining indexes on multiple keys. -5 Marks
- 4) a) Discuss in detail about primary file organization. -5 Marks  
b) By considering relevant example, show insertion and deletion operations on a B-Tree. -5 Marks
- 5) a) With an example, describe in detail about B+ Tree index structure. -5 Marks  
b) What is primary index? In what way primary index is different from secondary and unique indexes? Briefly describe hash based indexing. -5 Marks



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## QUESTION BANK

### OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

Class - III B.Tech (CSE-A&B) - I Sem

Name of the Faculty- K. Nuka Raju

#### UNIT -I

- 1) a) Explain the Structure of Complex systems - 5 M  
b) Explain the Inherent Complexity of Software - 5 M
- 2) a) Explain Attributes of Complex System -5 M  
b) Explain the Organized and Disorganized Complexity of software - 5 M
- 3) a) How to Bring Order to Chaos. Explain. - 5 M  
b) How to Design Complex Systems. Explain. - 5 M
- 4) a) Explain the foundation of Object Model - 5 M  
b) Explain the Elements of Object Model. - 5 M
- 5) a) How to apply the Object Model. Explain - 5 M  
b) Explain the Inherent Complexity of Software - 5 M

#### UNIT -II

- 1) a) Explain the Nature of object - 5 M  
b) Explain Relationships among objects - 5 M
- 2) a) Explain the Nature of Class. - 5 M  
b) Explain Relationships among objects -5 M
- 3) a) Explain the Interplay of Classes and Objects - 5 M  
b) Identifying Classes and Objects - 5 M
- 4) a) What is the Importance of Proper Classification - 5 M  
b) How do you Identify the Classes and Objects - 5 M
- 5) a) Explain Key abstractions and Mechanisms - 5 M  
b) Explain Relationships among objects - 5 M

#### UNIT -III

- 1) a) Why we model? What is the importance of model - 5 M  
b) Explain the Conceptual model of UML - 5 M
- 2) a) Explain the Architecture of UML - 5 M  
b) Explain about Classes - 5 M
- 3) a) Explain about Relations - 5M  
b) Explain about Common Mechanisms - 5 M
- 4) a) Explain about Class diagrams. - 5 M  
b) Explain about Object Diagrams - 5 M
- 5) a) Explain the Architecture of UML . - 5 M  
b) Explain about Relations . - 5 M

#### UNIT -IV

- |   |       |
|---|-------|
| 1) a) Explain about Interactions          | - 5 M |
| b) Explain about Interaction diagrams     | - 5 M |
| 2) a) Explain about Use cases             | - 5 M |
| b) Explain with Usecase Diagrams.         | - 5 M |
| 3) a) Explain Activity Diagrams           | - 5 M |
| b) Explain about Interactions             | - 5 M |
| 4) a) Explain about Interaction diagrams. | - 5 M |
| b) Explain Activity Diagrams              | - 5 M |
| 5) a) Explain with Usecase Diagrams.      | - 5 M |
| b) Explain about Interactions             | - 5 M |

#### UNIT -V

- |                                      |       |
|--------------------------------------|-------|
| 1) a) Explain about Events           | - 5 M |
| b) Explain about Signals             | - 5 M |
| 2) a) Explain about state machines   | - 5 M |
| b) Explain processes and Threads     | - 5 M |
| 3) a) Explain about time and space.  | - 5 M |
| b) Explain about State chart Diagram | - 5 M |
| 4) a) Explain about Events.          | - 5 M |
| b) Explain processes and Threads.    | - 5 M |
| 5) a) Explain about Signals          | - 5 M |
| b) Explain about state machines      | - 5 M |

#### UNIT -VI

- |                                      |       |
|--------------------------------------|-------|
| 1) a) What is a Component? Explain.  | - 5 M |
| b) Explain about Component Diagrams  | - 5 M |
| 2) a) What is Deployment? Explain.   | - 5 M |
| b) Explain about Deployment Diagrams | - 5 M |
| 3) a) What is Deployment? Explain.   | - 5 M |
| b) Explain about Component Diagrams  | - 5 M |
| 4) a) What is a Component? Explain.  | - 5 M |
| b) Explain about Deployment Diagrams | - 5 M |



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## III B.TECH - I SEM Question Bank

**Subject Name: OPERATING SYSTEM**

**Branch: CSE A & B**

**Faculty: Harshitha.D**

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### UNIT -1

- 1) a) Explain operating system concepts?
  - b) What is system call? Explain different types of system call?
- 2) a) Explain operating system services in detail?
  - b) Explain system calls in detail?
- 3) a) Explain operating system components?
  - b) Explain types of operating system ?
- 4) a) Explain multiprocessor systems and distributed systems?
  - b) Explain system call types?
  - c) Explain any 3 types of operating system?

### UNIT -2

- 1) a) Explain about process concepts (The process, Process State Diagram , Process control block) ?
  - b) Explain scheduling algorithms?
- 2) a) Explain process scheduling?
  - b) Explain Interprocess Communication and Threading Issues?
- 3) a) Explain process concept, Process State Diagram , Process control block,operations on Processes?
  - b) Explain Scheduling Concepts, Scheduling Criteria, Scheduling Algorithms?
  - c) Explain Interprocess Communication and Threading Issues?
- 4) a) Explain Scheduling Queues and Schedulers in detail?
  - b) Explain Operations on Processes and Scheduling Criteria?



### UNIT -3

- 1) a) Explain about memory management?  
b) Explain page replacement algorithms?
- 2) a) Difference between paging and segmentation?  
b) Explain about Virtual memory management?
- 3) a) Explain Contiguous Memory Allocation ?  
b) Explain Demand Paging and Thrashing ?
- 4) Explain memory management and Virtual memory management concepts?

### UNIT -4

- 1) a) Explain the Critical- Section Problem and Classic Problems of Synchronization?  
b) Explain Deadlock Characterization, Deadlock Prevention, Detection and Avoidance?
- 2) Explain concurrency and principles of deadlock?
- 3) Explain Process Synchronization ,Synchronization Hardware, Classic Problems of Synchronization, Synchronization examples?
- 4) Explain Critical- Section Problem, Semaphores, Monitors, System Model?

### UNIT-5

- 1) a) Explain File system mounting, file sharing and protection?  
b) Explain free-space management?  
c) Explain disk scheduling?
- 2) Explain File system Interface?
- 3) Explain File System implementation?
- 4) Explain Mass-storage structure?

### UNIT-6

- 1) a) Explain Mass-storage structure?  
b) Explain Application Process management?

2) a) Explain Synchronisation, Interrupt?

b) Explain Android Runtime Application Development, Application Structure?

3) a) Explain Interprocess Communication in LINUX?

b) Explain Operating System Services?

4) a) Explain linux system (Components of LINUX, Interprocess Communication, Synchronisation, Interrupt, Exception and System Call)?

b) Explain Android Software Platform in detail (Android Architecture, Operating System Services, Android Runtime Application Development, Application Structure, Application Process management)?



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## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### QUESTION BANK (2018-2019 AY)

Subject: UNIX Programming

Year/Sem : III/I

Faculty: Mr. V. Srinivas (CSE-A)

Regulation: R16

Faculty: Mrs. G. Sujatha (CSE-B)

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### UNIT I

1. a) What are the features of Unix operating system? (5 M)  
b) Explain the following basic UNIX commands ? (a) ls (b) cat (c) cal (5 M)
2. a) Explain the UNIX architecture (5 M)  
b) Explain the following unix commands (5 M)  
i) cp ii) rm iii) mv
3. Explain the networking commands in unix (10 M)
4. (a) Explain about how to create a directory in UNIX? (5 M)  
(b) Explain about how to remove a directory in UNIX? (5 M)
5. a) Explain the Command Substitution with examples? (5 M)  
b) Multiple Commands in Unix? (5 M)

### Unit II

1. a) Explain about the file system in UNIX (5 M)  
b) Discuss about the Basics of Files in UNIX (5 M)
2. a) Explain the file permissions in UNIX (5 M)  
b) Discuss about the Directory Hierarchy? (5 M)
3. a) Explain the file attributes and permissions in UNIX (5 M)  
b) The **file** command in UNIX, explain? (5 M)
4. Briefly explain about how to change the file permissions using **chmod** command (10 M)
5. a) Explain about how to change the ownership of a file (5 M)  
b) Explain about how to change the group of a file (5 M)

### **Unit III**

- 1.a) Explain the shell command line structure (5 M)  
b) Discuss about Meta Characters in Unix (5 M)
- 2.a) How to create new shell commands (5 M)  
b) Explain command arguments and parameters (5 M)
- 3.a) How to set program output as arguments (5 M)  
b) Briefly explain about shell variables (5 M)
- 4.Explain the I/O Redirection with examples? (10 M)
5. a) Explain about for loop with example? (5 M)  
b) Describe about while loop with example? (5 M)

### **Unit IV**

1. a) Explain about the following filters (5 M)  
(i) cut (ii) paste (iii) uniq  
b) Explain about the following filters (5 M)  
(i) head (ii) tail (iii) sort
2. Briefly explain about grep family with suitable examples (10 M)
3. a) Explain the features of stream editor sed (5 M)  
b) Explain the structure of sed (5 M)
4. a) Explain the concept of awk? Write about fields and records (5 M)  
b) Draw the standard awk script design? How can we use commands in awk script file? (5 M)
5. a) What are the good files in UNIX, explain? (5 M)  
b) What are the good filters UNIX, explain? (5 M)

## Unit V

- 1) a) Briefly explain about shell variables (5 M)  
b) Explain the export command (5 M)
- 2) a) Explain about the read command in shell programming (5 M)  
b) Positional Parameters in UNIX (5 M)
- 3) a) Explain the exit status of command (5 M)  
b) Explain about the set command (5 M)
- 4) a) Discuss about branching control structures (5 M)  
b) Discuss about loop control structures (5 M)
- 5) a) Explain about the following: (5 M)  
(i) expr command (ii) the here document  
b) Explain about the following: (5 M)  
(i) script (ii) eval (iii) exec

## Unit VI

- 1.a) What is a process, explain? (5 M)  
b) Briefly discuss about the parent and child processes (5 M)
2. a) Explain various types of processes (5 M)  
b) Briefly explain about foreground and background processes (5 M)
- 3 a) Explain about internal and external commands (5 M)  
b) Explain how to create a process (5 M)
- 4) Explain the following commands with suitable examples : (10 M)  
(i) trap (ii) stty
- 5) a) Explain about the kill command (5 M)  
b) Discuss about job control (5 M)