

ACADEMIC YEAR: 2022-2023

YEAR: III
SUBJECT NAME: COMPILER DESIGN

SEMESTER: II
REGULATION: R20

QUESTION BANK

UNIT-3

| Q. No | Question | Marks | Cognitive level |
|--------------|---|--------------|------------------------|
| 6 | a) Explain in brief about three address codes. | 5M | L2 |
| | b) Translate the arithmetic expression $a[i]=b*c-b*d$ into a syntax tree, quadruples and triples. | 5M | L3 |
| 7 | 7) Explain the role of types and declarations in i) Type expressions. ii) Type Equivalence. iii) Declarations. iv) Storage layout in local names. v) Sequences of Declarations | 10M | L2 |
| 8 | a) Write a note on simple type checker and list the different types of type checking. | 5M | L3 |
| | b) Generate the three-address code for the following code fragment. $a = b + 1$ $x = y + 3$ $y = a / b$ $a = b + c$ | 5M | L3 |
| 9 | a) Give syntax directed translation scheme for simple desk circulator. | 5M | L2 |
| | b) Explain in brief about Backpatching? | 5M | L2 |
| 10 | What are different intermediate code forms? Discuss different Three Address code types and implementations of Three Address statements. | 10M | L3 |

UNIT-4

| Q. No | Question | Marks | Cognitive level |
|-------|--|----------|-----------------|
| 1 | Explain about principle sources of optimization and loop optimization | 10M | L2 |
| 2 | a) Explain in detail about Basic blocks. b) What is flow graph? Explain how flow graph can be constructed for a given problem. | 5M 5M | L2 L1 |
| 3 | Explain in brief about Basic blocks and Flow graphs? | 10M | L2 |
| 4 | What is a flow graph? Explain how flow graph can be constructed for a given program. Main() { int sum, n, i; sum=0; for i:=1 to n do sum:=sum+i; write(sum); } | 10M | L2 |
| 5 | What is the role of code Optimizer in compiler? Is it a mandatory phase? Explain the various sources of optimization. | 10M | L2 |
| 6 | a) Explain data flow equations with an example b) Explain about Structure Preserving Transformations | 5M 5M | L2 |
| 7 | Explain the following peephole optimization techniques? i. Elimination of Redundant Code ii. Elimination of Unreachable code | 10M | L3 |
| 8 | a) Write a short note on peephole optimization and various operations used in it. b) Describe Loop unrolling? Describe its advantage with your own examples. | 6M 4M | L1 L2 |
| 9 | What is Loop Optimization? Explain various Loop Optimization Techniques with Examples | 10M | L2 |
| 10 | Define Basic Block? Explain Optimization of Basic Blocks with an example | 10M | L2 |

UNIT-5

| Q. No | Question | Marks | Cognitive level |
|-------|---|----------------------|-----------------|
| 1 | Explain various storage allocation strategies with its merits and demerits. | 10M | L2 |
| 2 | Define activation records. Explain how it is related with runtime storage allocation. | 10M | L2 |
| 3 | What is runtime stack? Explain the storage allocation strategies used for recursive procedure calls. | 10M | L2 |
| 4 | Explain the main issues in code generation. How to handle them? Discuss. | 10M | L2 |
| 5 | a) Discuss about register allocation and assignment in target code generation. | 5M | L2 |
| | b) Discuss how induction variables can be detected and eliminated from the given intermediate code B2: i: = i+1 t1: =4*j t2: =a[t1] if t2<10 goto B2 | 5M | |
| 6 | How the stack can be allocated in Activation trees and records. | 10M | L1 |
| 7 | a) With neat sketch explain the activities of caller and callee in stack allocation strategy with an example. What is the role of parameter passing in it? | 5M | L1 |
| | b) Explain about Variable length data on the stack. | 5M | L2 |
| 8 | Explain briefly about a) Access links. b) Manipulating Access links. c) Access links for procedure parameters. d) Displays. | 2M 2M 3M 3M | L2 |
| 9 | a) Explain the following terms: i) Register Descriptor ii) Address Descriptor iii) Instruction Costs | 5M | |
| | b) Give an example to show how DAG is used for register allocation | 5M | |
| 10 | Explain code generation Algorithm with Example? | 10M | |