



SYSTEM PROGRAMMING AND COMPLIER CONSTRUCTION

MAY 2019

Computer Engineering (Semester 6)

Total marks: 80

Total time: 3 Hours

INSTRUCTIONS

(1) Question 1 is compulsory.

(2) Attempt any **three** from the remaining questions.

(3) Draw neat diagrams wherever necessary.

1.a. Differentiate between system software and application software. (5 marks)

1.b. Explain different functions of loader. (5 marks)

1.c. Explain forward reference problem and how it is handled in assembler design. (5 marks)

1.d. Explain macro and macro expansions. (5 marks)

2.a. Find FIRST & FOLLOW for the following grammar. (10 marks)

$S \rightarrow Bb | Dd$

$B \rightarrow aB | \epsilon$

$D \rightarrow cD | \epsilon$

2.b. With reference to assembler explain the following table with suitable example (10 marks)

i. MOT

ii. POT

iii. ST

iv. BT

3.a. Explain Synthesized and Inherited attribute with example. (10 marks)

3.b. Explain different code optimization techniques with example. (10 marks)



4.a. Apply dead code elimination technique for the following code (5 marks)

```
int count;
void foo()
{
    int i;
    i=1;
    count=1;
    count=2;
    return
    count=3;
}
```

4.b. Eliminate left recursion from the following grammar (5 marks)

```
S-> (L) | x
L-> L,S | S
```

4.c. Explain different types of loaders in details. (10 marks)

5.a. Draw flowchart of a Pass-I of two pass assembler design and explain in detail. (10 marks)

5.b. Explain different features of macro with example. (10 marks)

6.a. For the following grammar construct LL(1) parsing table and parse the string (a-a) (10 marks)

```
S-> F
S-> (S-F)
F-> a
```

6.b. Explain different issues in code generation. (10 marks)