DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER VII [CE]
SUBJECT: (CE 718) COMPILER CONSTRUCTION

Examination	**: Second Sessional**	**Seat No**	**: _____**
Date	**: 08/10/2020**	**Day**	**: Thursday**
Time	**: 10:00 AM-11:15 AM**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

(a) What can be the possible issue(s) in manual deallocation of memory? How to overcome the issue(s)? **[2]**

(b) For the C-like code given below, what will be the output? **[2]**
   i. if static scope is supported
   ii. if dynamic scope is supported

```
float n = 0.5;
void show() {
        printf("%f" ,n);
}
void small() {
        float n =0.625 ;
        show();
}
int main (){
        show();
        small();
        printf("\n");
}
```

(c) How should the nodes of the control flow graph be visited so that finding the dominator and back edges is faster? Justify your answer briefly. **[2]**

(d) State True/False and justify : Ambiguous grammar can be LL(1) **[2]**

(e) Describe characteristics of an Operator Grammar **[2]**

(f) Compare Top-Down Parsing with Bottom-Up Parsing Method. **[2]**

Q.2 Attempt **ANY TWO** of the following questions.

(a) Construct LL (1) Parser for the below given grammar **[6]**
E → TA
A → +TA | ^
T → a | (E)

(b) Construct **Operator Precedence Graph** for below given grammar. Here, '||' indicates OR while '&&' represents AND operation. **[6]**
E → T || E | T
T → F && T | F
F → (E) | a

(c) Compute the **FIRST** set for below given grammar. Here, A is the start symbol. **[6]**
A → **i** B = **e**
B → SB | ^
S → **[e**C **]** | **.i**
C→ **e**C | ^

Q.3 (a) List the four parameter passing methods for any procedure and compare them with a suitable example. **[6]**

(b) Discuss the four cases of block deallocation in the boundary tag method with appropriate diagram. **[6]**

OR

Q.3 (a) What is static link and dynamic link? **[6]**
Describe the allocation of activation records(with static and dynamic links) for the given procedure call Main→A→B→C→B→C

```
program Main;
        procedure A;
                procedure B;
                        begin C; end
                procedure C;
                        begin B; end
        begin B; end
begin A; end
```

(b) Suppose the heap consists of **seven chunks**, starting at address 0. The sizes of the chunks, in order, are **80, 30, 60, 50, 70, 20, 40 bytes**. If the resultant free chunk is less than 8 bytes then the entire chunk is allocated. If we request space for objects of the following sizes: **32, 64, 48, 16,** in that order, what does the free space list look like after satisfying the requests, if the method of selecting chunks is: **[6]**

i. First Fit.

ii. Best Fit.