Sanjay Ghodawat University, Kolhapur

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EXM/P/09/00

Year and Program:	**School of Technology**	**Department: Computer Science and Engineering**
Course Code: CST305R1	**Course Title: Compiler Design**	**Semester :V**
Day : Wedneday **Date:16.12.2020**	**End Semester Examination**	**Time:2 Hrs.** **Max Marks:50**

Instructions: 1) All Questions are compulsory.
2)Assume suitable data wherever necessary.
3) Figures to the right indicate full marks.

Q.1	**Answer the following (any Two)**–	**Marks**	**Bloom's Level**	**CO**
a)	Explain the phases of the compiler with a suitable example.	8	L2	CO1
b)	Compiler is executing the following given branching statement if <expression> then statements or if <expression> then statements else statement. and same time , the context free grammar is generated as follows: stmt -> if expr hem stmt | if expr then stmt else stmt | null expr -> term relop term | term term -> id | number. Describe the steps lexical analyzer follows to generate and recognize the tokens for the following: 1. Recognization of keywords and identifiers 2. Recognization of number 3. Recognization of white spaces.	8	L2	CO1
c)	Describe the panic mode recovery strategy applied by the lexical analyzer and findout the number of tokens along with the token classes in the following C codes.	8	L2	CO1

```
main ( )
{
    /* int a = 10; */
    int * u, * v, s;
    u = &s;
    v = &s;
    printf ("%d%d", s, * u);
    // code ended
}
```

```
//program to perform addition operation
#include<stdio.h>
#include<string.h>
int main( )
{
int a=10,b=20,c;
c=(a + b)*60.0 ;
printf("\n c = %d ", c);
}
```

Q.2 **Answer the following (any Two) –**

a)	Construct the Predictive Parsing Table and Write the steps to derive a string w=id + id * id. P = { E -> TE' E' -> + TE' | **ε** T -> FT' T' -> *FT' | **ε** F -> id | (E) } G = (V, ∑ , S, P) whereas V = { E, E', T, T', F } and ∑ = { +, *, (,), id , **ε }**	8	L3	CO2
b)	Explain the Shift Reduce Parser and conflicts in Shift Reduce Parser with suitable example.	8	L3	CO2
c)	List and Explain the types of attributes used during the semantic analysis to generate the intermediate code in a compiler with a suitable example.	8	L4	CO3

Q.3 **Answer the following (any Two)**

a)	Consider the following grammar: S → abS | acS | c and Solve the following : 1) Construct Canonical set of LR(0) items for the grammar. 2) Construct the LR(0) and SLR Parsing Table	9	L3	CO2
b)	Apply Three Address Code technique to represent the given expression **a = b * – c + b * – c.**in Quadruple, Triple and Indirect Triple.	9	L3	CO4

c) Write down the algorithm to construct the flow graph and apply it to construct flow graph for the following intermediate code. 9 L3 CO4

1) PROD = 0

(2) I = 1

(3) T2 = addr(A) – 4

(4) T4 = addr(B) – 4

(5) T1 = 4 x I

(6) T3 = T2[T1]

(7) T5 = T4[T1]

(8) T6 = T3 x T5

(9) PROD = PROD + T6

(10) I = I + 1

(11) IF I <=20 GOTO (5)

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